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**COMING**

As previously announced, the April number of **AMERICAN FORESTS** will be devoted exclusively to forest fire prevention and protection—a special issue of ninety-six pages, graphically illustrated. Here are a number of the outstanding articles scheduled:

"Forest Fires — the Red Paradox of Conservation," by Colonel W. B. Greeley; "Fire or Prosperity—the South's Great Problem," by Representative Wall Doxey of Mississippi; "What Forest Fire Control Means to the Northwest," by Governor Charles A. Sprague of Oregon; "The Red Menace to Wildlife," by Dr. Ira N. Gabrielson; "Fire, Floods and Erosion," by H. H. Bennett; "Outdoor Recreation—Gone With the Flames," by Arno Cammerer.

"Men Against the Flames," by F. A. Silcox; "Forest Fires—Challenge to Federal Legislation," by Senator Charles L. McNary of Oregon; "Organizing for Common Defense," by Wilson Compton; "The CCC as a Fire-Fighting Unit," by John D. Guthrie; and others of outstanding interest.



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The Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. All manuscripts should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles . . . Notice of change of address for **AMERICAN FORESTS** should be received by the tenth of the month preceding issue.

Member A. B. C.

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READERS' FORUM

CHINESE SCHOLARS NEED BOOKS

SIR: Ever since Japan's military occupation of Peiping, all national institutions of learning in that historical city have been unable to function. In view of this situation, we have established an office at Kunming, Yunnan. We have been collecting books and journals in order to meet the intellectual needs of Chinese scholars in this hour of distress.

In order to keep Chinese scholars informed as to the recent development of various branches of science, we are building up a special reprint collection which will be of great value to investigators engaged in scientific research.

Knowing that your institution has made notable contributions to learning, and cognizant of your intellectual sympathy for China, we earnestly hope that you will find it possible to ask each of your scientific members to send us a complete set of his reprints if they are still available for distribution.

As we have to start our work entirely afresh, we are in urgent need of books and periodicals of all kinds, old or new, especially standard works in various fields. Donations of books from American and Canadian authors may be sent to us care of the International Exchange Service, Smithsonian Institution, Washington, D. C., which makes monthly shipment to China.

As a great deal of scientific work is being carried on in China in spite of the war, your contributions will render a great service to the present and future generations of intellectual workers in this country.—*T. L. Yuan*, Acting Director, National Library of Peiping, Kunming, China.

FUGITIVE TREES FOR CHESTNUT FOREST

SIR: Like modern Noahs fleeing before the deluge of a deadly blight, botanists at State College, in North Carolina, are rearing young chestnut trees, tremulously hopeful that the Asiatic blight will not find them out this far from the chestnut's natural habitat. When the scourge has killed the last tree in the highlands and has no further victims to feed upon, the young trees thriving on the campus at the College will be available for the eons-long task of replenishing the earth.

They will not have long to wait. Two decades ago, the chestnut was one of North Carolina's most lordly trees. Highly prized as lumber, it also was valuable for chemical extracts, and for pulp. But chiefly it was beloved because of its fruit—the succulent chestnut. Twenty-five years ago, mountain wagons, drawn by oxen, brought full loads of the chestnuts down into the foothill towns. Large, easily cracked, the chestnut was almost the official nut of North Carolina. To the Cherokees of the Smokies, the chestnut was a traditional food.

About 1904, an Oriental fungus ap-

peared on the trees, and with appalling speed swept through New England and entered the south. Now, in 1939, great splashes of grey trunks in the live forests of the Blue Ridge Mountains bear witness to the arboreal tragedy. More than ninety-five per cent of North Carolina's chestnut trees are dead or dying.

Every effort to halt the scourge failing, forestry men at State College several years ago transplanted healthy trees here, 200 miles from the chestnut belt. After four years, the young trees are healthy and thriving, and their guardians speculate that when the blight has run its course, their thin little line of sprouts will be the progenitors of another mighty chestnut forest in North Carolina.—*Bill Sharpe*, Department of Conservation and Development, Raleigh, North Carolina.

KINGS RIVER—FOREST OR PARK

SIR: Reference is made to the article entitled "Another Forest—Park Fight Looms" which appeared in your January issue, and which, with the exception of the first two paragraphs, consisted of the quoted statement of S. B. Show, chief of the California region, United States Forest Service.

The article was interesting as a statement of one point of view. However, there are certain parts which would bear scrutiny. In order to examine the statement with a dispassionate eye, and in order to dissipate some of the heat which Mr. Show apparently generated in preparing his statement, it would appear that the cause of truth might be served by analyzing some parts of the statement.

"Many studies of the situation have been made and the resource relationship between the mountains and the valley areas clearly defined. The conclusions reached have always been adverse to the creation of a park in this region."

In 1907 a committee of the Sierra Club, composed of W. E. Colby, J. N. LeConte, and E. T. Parsons, made an investigation of the Kings River region. Their report was published, by order of the board of directors of the Sierra Club, in the *Sierra Club Bulletin*, for January, 1907. In order that each person should judge for himself, the above report should be read in its entirety. However, an idea of its import may be gained by quoting the first sentence under the section headed "Recommendations":

"Aside from our own recommendation that this region be set aside as a park area, there are several suggestions which we most respectfully present to the Forest Service and request that favorable action be taken thereon and that the suggestions be carried out in the near future."

In Mr. Show's statement, he consistently uses the word "resource" in the economic sense. Literally, a resource is that which is resorted to for aid or support. The millions of people who resort to the

national parks each year would find it difficult to place a dollar sign before the relaxation, recreation, and inspiration which they draw from surroundings in which the feeling of a wilderness is not dissipated by the bleat of a sheep or the cry of "Tim-ber." And under the Act of February 1, 1905, it is difficult to reconcile the statement that "... there are no desirable recreational policies or improvements for the Kings River area, which any other government agency may wish to put into effect, that the Forest Service cannot provide" with the statutory injunction that "... no national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of waterflow, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States."—*Russell P. Andrews*, Estes Park, Colorado.

REGROWING CHRISTMAS TREES

SIR: I was very much impressed with the article "New Slants on Growing Christmas Trees" by Jackson M. Batchelor, in your January issue.

This regrowth practice of growing trees is very practical from our past experience, and I quite agree with this grower, H. R. Cox, of New Brunswick, New Jersey, that Christmas trees can be grown that way, especially with the assistance that Mr. Cox gives the branches by tying them to a bamboo post to aid upward growth.

This method of growing Christmas trees from branches left on stumps has been used for many years in Switzerland, and we are spreading this information to the producers and farmers that supply us with trees in the United States and Canada.—*Alvin H. Hofert*, Newark, New Jersey.

SELLING SPRUCE IN CANADA

SIR: I should like to take exception in a mild way to one statement in your article on white spruce which appeared in the January issue, namely—"No attempt is made to distinguish the several spruces in the trade."

I believe that would be true in connection with spruce produced in eastern Canada, which is generally sold as eastern spruce, but we operate a mill at The Pas, Manitoba, cutting spruce which grows in Saskatchewan, where the stand is practically all white spruce, there being no red spruce, as far as we know. This spruce we sell as western white spruce. A few years ago we also operated a mill in British Columbia and cut Engelmann spruce. This we sold as Engelmann spruce. We found a good many customers who preferred one or the other for different purposes—customers who certainly did distinguish between the two species.

I wrote the above not in any criticism of your article but as a possible bit of information.—*R. C. Winton*, President, Winton Lumber Sales Company, Minneapolis, Minnesota.

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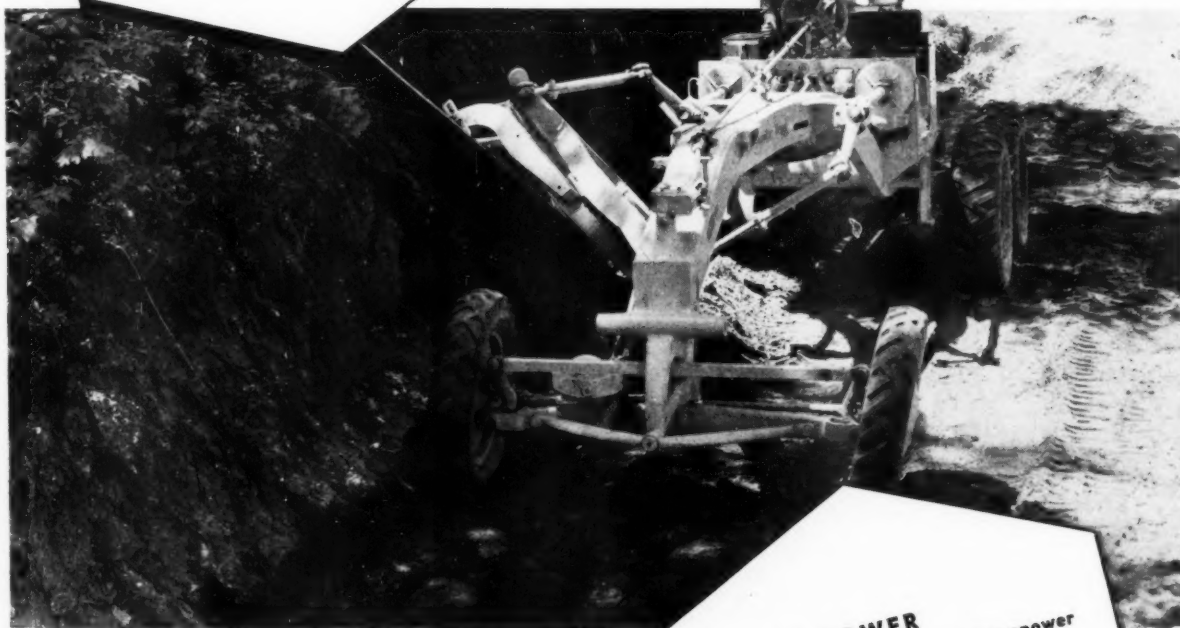
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HENRY SOLON GRAVES
President, The American Forestry Association
1923-24; 1935-36

OUR PRESIDENTS

board on June 26, 1934, to complete the unexpired term of George D. Pratt, when he served through 1936.

A pioneer in forestry in America, Henry Solon Graves has no peer in the fields of education and administration. Professor of forestry and first Director of the Yale Forest School, from 1900 to 1910, he was chosen and appointed in that year by President Taft to succeed Gifford Pinchot as Chief Forester of the United States. He served in this capacity for ten years, until March, 1920, when he returned to Yale, again to direct the Forest School and to become Provost of the University in 1923.

In 1918 Col. Graves was elected an Honorary Member of the Royal Scottish Arboricultural Society of Edinburgh, Scotland, in recognition of his eminent services to forestry. At that time, he shared this distinction with only one other citizen of the United States, Dr. Charles Sprague Sargent, who was elected in 1889.

During the World War Col. Graves served with distinction in the organization of the woods operations in France, where the Tenth Engineers—later combined with the Twentieth to form the world's largest regiment—made its remarkable lumber production record for the American Army.

A leading forester, beloved instructor, and outstanding figure in his profession today, his untiring zeal and enthusiastic personality have endeared him to thousands whose lives he has touched. As President of the American Forestry Association and now as an active director his constructive leadership continues always an inspiration in carrying forward the work to which it is dedicated, and which he so sincerely believes the Association alone can most effectively accomplish.

■ Following Charles Lathrop Pack in office, Col. Graves was elected 15th President of the Association at the Annual Meeting held in New York City on January 17, 1923. Re-elected for a second term in January, 1924, he reluctantly resigned on March 1 because his duties at Yale University were too heavy to permit him to take the active part he liked to take in the affairs of the Association as its president. Col. Graves also served as the Association's 17th president, by election by the

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Vanderbilt Webb, 1942 — New York — New York Forestry Association

William F. Wharton, 1942 — Massachusetts — National Association of Audubon Societies



THE OUTLOOK for the American elm grows darker and darker. This noble tree seems to be without honor in Congress. Several weeks ago the Department of Agriculture recommended that the Deficiency Bill for 1939 carry an item of \$365,000 for continuing the fight to save the elm from the Dutch elm disease. The Bureau of the Budget trimmed this recommendation to \$200,000 and the House Subcommittee on Appropriations when the item came before it completed the trimming to the zero point. In the Senate the item fared no better although Senators Barbour of New Jersey and Walsh of Massachusetts ventured an amendment to restore the \$200,000 recommended by the Budget.

In contrast, the Department of Agriculture recommended an item of \$5,417,000 for extermination of grasshoppers, Mormon crickets and white fringed beetles. The Bureau of the Budget reduced the recommendation to \$3,300,000 and the House Subcommittee on Appropriations downed it to an even \$2,000,000. The Deficiency Bill cleared the Senate on February 6, with the item restored to \$5,417,000.

Too bad farmers do not own more elm trees!

* * * * *

Mr. Oxholm's brief account of what he calls "Hara-Kiri" on the West Coast looks like a clear case of selling America short. Forest industry in this country needs foreign markets for its finished products but when an export law permits Japan and other foreign nations to buy our finest timber in the round and thereby rob American labor of the employment that would otherwise be called for in its manufacture, conservation in its full sense goes out the window and American labor to the breadline. Here, it would seem, is a situation that calls for a law to stop a law.

A note of interest is added by Mr. Oxholm in his letter transmitting the article. He says: "Just as I write, the first shipment of Douglas Fir peeler logs has cleared the port of Tacoma for Sweden. We are naturally considerably disturbed in regard to this peeler log export because it means that Sweden will make a heavy inroad on our established foreign plywood business and is doing so on the strength of our willingness to part with the only natural advantage still left to us. I need not tell you that the Swedes have equipped their mills with American machinery, that an American glue company is operating a glue factory in Stockholm and that in short, we have not only furnished technical knowledge and machinery to our foreign competitors, but are now also furnishing the raw material. As far as I can see our foreign competitors supply the appetite, and it is only left to us to provide relief for the labor which is being displaced through this foreign competition."

"Peeler logs," it should be explained, is a term used in the Pacific Northwest to designate the high quality logs obtained only from the largest and finest trees that grow in those magnificent forests and are utilized for manufacture into veneer for the production of clear-faced plywood. The word "peeler" is used because the logs instead of being sawed are rotated against knives which peel off thin layers of veneer in continuous sheets.

Orin Rusten
Editor.



A formidable salto, or waterfall, marks the northern end of the rapids and,—the jungle is full of beauty and mystery

"Old Thirty-four"—the sturdy motor scow on which we left the seaport of Frontera to plow through the raging storm—gales, and continuous rain on the swiftly rising river

(Photographs by the author)



RAIN ON THE RIVER

Four Hundred and Fifty-two
Miles on Tropical Mexico's
Waterways in Flood Times

By
ARTHUR STANLEY RIGGS



The ranch house at Encanto, and some
of the native houses, seen from the river

ANYONE who has ever done any tropical jungle work should know enough to avoid even the end of the rainy season. Nevertheless, one December I hurried down to Mexico to make an inspection of a vast ranch near the Guatemalan border, and to investigate some archaeological remains said to be unidentified. My experience with the floods really began when Don Max, superintendent of the Encanto Ranch, and I left the seaport of Frontera on a motor-scow, but the scenery for a hundred and fifty miles to the south held so little of interest and the rains and gales were so continuous that until we reached Salto de Agua, the head of navigation, there was nothing especially noteworthy.

The town of Salto stands well back from the Tulijá River, some sixty feet above its normal level. Half a mile or so to the south a formidable *salto*, or waterfall, marks the northern end of a four-mile-long rapids. Small steamers and motor craft ply between the sea at Frontera and Salto, but beyond only the mahogany dugouts of the native Indians can traverse the rivers that form the transportation system of the contiguous states of Tabasco and Chiapas. On the bluff at Salto is the residence and general trading post of a German, Don Federico, and Don Max and a young American oil geologist, Don Tomas, and I stopped there.

Hardly had we sat down to dinner when a river *capataz*, or foreman, reported that the Tulijá was rising at the rate of eighteen inches an hour. Floods in that region are nothing new, of course. But the native depopulation due to years of revolution and banditry made them serious economic factors in Mexican life. With no one to protect river banks or plantations and clearings beyond them, the damage from floods over a period of years is incalculable. Fruit trees and hardwoods were undermined and swept away, small plantations wiped out, river banks badly eroded, thousands of acres rendered useless, hazards to navigation created in all the complicated network of streams throughout Tabasco and Chiapas.

It rained for two full days after we reached Salto. The river crept steadily up the slope on the summit of

which the store stood, and boiled over a slightly lower reach fifty yards north. Invading the property from behind, it cut us off completely from the town, and turned Don Federico's big compound into a swirling morass where hogs and buzzards quarrelled for drifting filth from store and town. The store proprietor began to worry about his salt when the turgid floods crept up to within three feet of his floor. He had several hundred bags of crude salt which he exchanged for the natives' crude lard each season—money is little used—and if the water entered, his year's capital and profits would vanish in a few minutes. Once before the water had stood five feet deep all through the building!

Inch by inch the river kept rising until it lapped at the doorstep, and the two most expert rivermen made splashing rounds and reported every half hour. But by daylight the flood came to a stop, to Don Federico's profane and voluble relief, exactly fourteen inches below the cement floor and his salt. Next day after luncheon, though the Tulijá still raged past some fifty feet above its usual level, it was down five or six feet from the house, and the Indians said we could safely start. As the town of Salto was flooded out, we had to take canoes to reach the donkeys that carried us over the six miles of trail leading past the *salto grande*, or long rapids, to the point where the Encanto canoes would take us aboard.

Next morning we started out in a tremendous mahogany canoe bright with green and white paint. Two minutes later the Tulijá caught at it with hungry menace. After fifteen minutes of frantic struggling the men managed to get us safely back to shore, considerably shaken up, soaked through and a little breathless. There they shifted suitcases and our food supply to a smaller, lighter *cayuco*, or canoe, added an extra pole to the two already in it, and we started afresh.

What a day that was! Steady rain and a chilling wind that cut through our wet clothes; grabbing at tree tops and pushing aside thick, trailing lianas that threatened to lasso and drag us from the canoe; swirled and tossed this way and that by the raging current for

thirteen endless hours! When it was over, and we tied up at a friendly native's shack, we had made exactly twenty-six miles, and our men were so exhausted they could scarcely keep awake long enough to eat.

The most distressing part of such travel is not the corns one grows where it hurts the worst, but the terrific vibration. The craft measures about forty-five feet in length by three feet in width. In the stern stands the *capataz* as steersman and rear poler. Just forward come the passengers. Then the luggage is securely packed

thicker than milk, drinks it as both refreshment and nourishment.

All day long the scenery was different from what we had anticipated because the rivers were so far out of their banks. Clumps of *caña brava*, a sort of bamboo, waved feathery tops at us as the rising current crept up their graceful stalks. Long patches of the usual crowded jungle growth were set apart by cultivated corn lands edging up out of the engulfing water that worked steadily back into the interior. Vast patches were completely devastated by the rivers, a mill race everywhere, and we saw one native house smashed into tangled debris at which the hungry stream was tearing like a buzzard. The silence was oppressive. Not a bird, not an animal of any sort, not a fish, even, made the least sign of life.

Two days and a half after we started we came to the mouth of the Encanto River. One glance at its torrential current was enough for old Epifanio, the *capataz* and steersman. Reluctantly we took ourselves and part of our luggage into a smaller canoe with a fresh crew, leaving the heavier craft to make its toilsome way to the ranch landing as best it might. Cloud bursts to the south had drained direct-



Our first canoe—forty-five feet long and three feet wide—hewn from one mahogany log and braced with partly natural ribs

and covered with tarpaulins. From about amidship to the bow the canoe is empty, to give the crew room to work.


The bowman thrusts his twenty-five foot sweep down, gets a grip on the bottom, and jog-trots aft along the broad gunwale, pushing his hardest. The shaking makes the heavy craft tremble like a blown leaf. He is followed by bowmen numbers two and three, who do the same thing. As each man reaches the pile of luggage he lifts his sweep high, steps into the canoe and runs forward with the same dreadful jogging gait. Thus an endless procession continues hour after hour until the passengers are dizzy, their heads ache and their bones crack.

How the Indians stand such exhausting work is a mystery, since practically all they have as food during the day is a little *pusol*, corn that has been soaked overnight in a solution of lye which loosens the skin. Women then grind it fine on stone slabs with stone rolling pins, separate the skin, ferment the meal, squeeze it dry as potcheese, and wrap it in plantain leaves tied with vines. When rest time comes, the Indian breaks off a chunk, puts it into a coconut shell half filled with water, stirs it around with his fingers, and when the result is no

In the midst of the raging flood the stream cut new channels and the men struggled for hours to navigate the monstrous craft in the angry waters



ly into the Encanto, bringing with them whole trees, tremendous masses of water-cabbage, debris of all sorts and not a few drowned and terribly swollen animals. A week before the men had known the channels thoroughly. Now we crept along cautiously, very loath to be hurled into the flood so near our destination. Every little way a new bar had been created and the old channel thrust violently to one side. The *cayuco* rocked and quivered under the impact of invisible and unanticipated eddies and backwashes that at times all but capsized us. Far outside its banks, the normally little river had



Normal stage of water where the Encanto and Bascan Rivers join to make the Tulija. When in flood the river rises and the current runs, swift and remorseless, carrying houses and even banks, trees and drowned stock away in an appalling whirl of disaster

gone wild and torn huge chunks out of its sloping banks, leaving gaping caverns with hundreds of vines streaming from their edges like the tangled hair of a drowned woman.

It was the loveliest, as well as the smallest, of all the streams, narrow and swift, full usually of brawling rapids now mere purring black hillocks, icy cold and menacing, with the matted growths of the jungle thrusting up and ever up until in places the forest giants were almost able to interlace their branches from opposite banks a hundred feet in the air. Again and again we had to swerve quickly to avoid the battering ram of a monster tree hurled squarely at us by the angry river. A touch from such a projectile, if it did not instantly sink the frail canoe, would inevitably have upset and dragged it to the bottom with its net of clutching branches, or rammed it—and us!—deep into the softened banks.

There was genuine danger in that last lap of the journey, but looking back over the whole 452 miles, our most exciting moments were not when we were afloat, but in the hours we spent on the high bank at Salto before the water reached the house. Facing us extended a roaring expanse of desolation, the water a saturated solution of mud. It reeked with the effluvia of the jungle. Past our lofty perch whirled giant trees, now sluggish, waterlogged things hardly moving, now rearing their huge bulks ten, twenty, even thirty feet in air, to crash down into the maddened waters with slashing malevolence. Once a small cabin danced past, a battered wreck of plantain-leaf roof and bamboo flooring, absurdly like a smashed eel-trap. Evil looking, red-headed *zopilotes* lurched by, screaming horribly as they tore at the festering purple carcass of the drowned heifer they were riding. Somebody's (Continuing on page 142)

Down through this raging river, thirty feet above its normal stage,—in a dull, cold rain, our faithful Indians dragged us through the tree-tops, poling when they could. Note the visible tops of high trees, and vicious eddies which had constantly to be avoided



TAKING FORESTRY TO THE WOODS

By HERMAN WORK

FOR many years, in arranging for the wood supply for the paper mill of the West Virginia Pulp and Paper Company at Covington, the management has been thinking ahead five, ten, twenty, forty years. The objective is to insure an adequate supply of pulpwood at economic cost in a highly competitive industry. This purpose may sound less human than it really is. It employs people gainfully, furnishes needed materials, and supplies its share of taxes to support the varied activities of government. It takes raw materials from a wide field, paying for the labor and hauling as well as for the trees themselves. Then it adds value to the raw material by use of labor, supplies and machinery, and sends the product to a distance, receiving money in return. The labor and materials are paid for and the whole transaction is closed with nothing hanging over

than 700 contracts. Some of these were filled by the labor of one man; other contracts included wood in which several hundred were interested, as owners of stumpage, cutters or haulers. In any case, it should be remembered that much the greater part of the value of wood comes from the labor of cutting, hauling out, and trucking or shipping to the mill, rather than from the stumpage.

It has been only natural for us to suggest ways to provide more from the timber, the labor and the land. You may say this is self-interest because it is obvious that without an adequate and reliable supply of wood the mill would have to shut down and the investment which is always large in pulp mills would be lost in large part if not in full. On the other hand, the local people depend upon the mill for employment and a market for their wood so that any advance that makes for a more perpetual supply of wood, more economic methods of harvesting and marketing it by the local people makes for their permanent welfare no less than for that of the company.

Then, too, there is a strong interest on the part of managers and executive personnel in providing continuous employment for those who share with them in the labor and returns of the business. Anyone who imagines that the prospect of unemployment for one's working companions and neighbors would be viewed with cool indifference has simply failed to discover the way people live and work and get along in our working America of today.

In dealing with many people, as we do, there are many opportunities, particularly in the case



More profit is secured from the timber, the labor and the land by direct trucking to the mill. This area was thinned out for pulpwood a few years ago

to mar or threaten the future, as there must be when money is borrowed.

Beginning shortly after the World War, the greater part of the wood for the Covington mill has come from individual land owners tributary to the plant. It is delivered under contracts that are made with timber owners, farmers, haulers, merchants and others. Last year there were more



of those who are really interested in bettering themselves, to give them helpful ideas that may lead to more forestry in the woods. From our experience which now covers almost twenty years, three simple principles have emerged for guidance: (1) advance no ideas you would not try yourself at your own expense; (2) put the idea into language that local farmers and small timber owners can understand; and (3) catch and hold their attention by telling them something to their advantage at a time when they are interested in a way that is not too dusty with age and use.

The suggestions we make carry no subsidies. They must be good enough to sell themselves. We might enclose with each contract or each weekly wood check, for example, a treatise on forestry or a glossary of terms used in forestry. Instead, we pick some one topic that is strictly to the point and timely.

Are these timely suggestions read? We hope a good many people, holding a wood check in one hand, will read the first paragraph, and that many of the more thoughtful, the more responsible, and the children, will be held to the end of the story, which is never far away. Almost anyone, in dry weather, will give more than a glance to a fire warning on pink paper. After continued rain, a suggestion to postpone hauling and thus save damage to roads and equipment is an appeal to reason that has helped to



Cutting trees low is practical for it saves timber in the biggest part of the tree and, too, a low stump often allows an extra stick at the top of the tree

change the bad old custom of tearing up the roads when they are soft. Some ideas may be explained by mimeograph, others by printed cards or pictures. We try to use enough color and novelty in the presentation to avoid dullness. Before any idea is put out in printer's ink, it is tested thoroughly in talks with producers. In fact, most of the ideas crystallize from observation, talks or suggestions, and may be several years in the making. For it is worse than useless to sow the seed before it is ripe, or before the ground has been prepared, or in the face of the wrong season.

The constant appeal is to the self-interest of the reader. Who of us is activated principally by broader or more altruistic motives? The world no doubt needs a small percentage of altruists. It must have a great majority of realists who make no bones about their principal need to provide by their own efforts for their own material needs, and the needs of those dependent on them. The frank, manly appeal of business is, "Better your earnings by accepting the suggestions we make." Have some foresters picked a more effective tool, when they scold or threaten calamity? A constructive effort is better served by tools of peaceable work than by the weapons of coercion, or hints of them.

Immediately after we began buying our wood instead of cutting it all on Company lands, our first subject was fire protection, in season and out. This propaganda was merely calling attention to the obvious fact that new values had been created by the market for small wood, and that these values should be protected by all those either directly or remotely interested. There is no doubt as to the effectiveness of these suggestions, in helping public agencies to turn the tide of popular opinion against fire. This turn came about 1927-1928 in the counties in the region of Covington.

Another early subject was full utilization of timber by cutting low stumps and crippled or failing trees. This idea appealed to owners, cutters and haulers, to each for a different reason. Other practical suggestions for saving timber and labor



Taking out trees like these would be good woods practice, for they have no promise of future value

were illustrated by cards with photographs showing good practice in labor technique. Too few of our "educated" people realize the fact that there are efficient ways and also faulty ways of digging a ditch, as well as filling a dental cavity. There is pleasure and pride in using a pick and shovel properly, although not everyone has learned this for himself. The worker is helped to a better living if he can be shown how to do his work more easily, more directly, and more happily.

The reader may have gained the idea that we have the heartiest respect for the man with the ax and saw, as well as for the owners of the land. How can we hope to secure better forest practices if we neglect the men who do the work in the woods and thus determine, in many details, if not as a whole, the nature of the future forest? Our experience leads us to believe that the country working man understands the nature of things and is contributing his full share to the movement for better use of woodlands. In making suggestions, we do not expect him, however, to struggle through a maze of fuzzy words and unfamiliar ideas to get to the point we are trying to make. The constant effort is to confine suggestions to things that can be done, and to use language that will be read by many people who may find the effort laborious.

It was a natural step from labor technique to management. We called attention to the ways of old woodsmen, who plan a cutting job to take advantage of seasons, lay of the land, or other natural aids to reduce operating costs. It is surprising how many farmers at first will want to put up their wood in ranks as they cut it, instead of leaving it in tree lengths until hauling time. Lost movements or useless work discourages improved handling of woodlands by lessening the wages of the workers and the possibility of profit from growing trees. Without profit, there can be no self-sustaining forestry.

The ability of the pulp industry to use wood in small sizes led long ago to frequent successive cuttings, on farm woodlands especially. So the principle of maintaining a balanced growing stock was a natural step. Remembering that we were suggesting modified practices for lands owned by others to be put into effect by workers not directly employed by ourselves and usually on a piece work basis, a little statement and exposition was drawn up, under the title, "What is Growing Stock?" The language, revised ten or fifteen times in the making, was designed for simplicity, clarity of thought, force, and persuasiveness. The thought was tested as usual by asking, "Would I adopt this idea at my own expense?" and by asking, "Just exactly what does that mean to someone who looks at these words for the first time?" You may be interested in reading the statement to see whether it meets the tests:

WHAT IS GROWING STOCK?

Farmers seldom dispose of all their stock at one time, whether it is chickens, sheep, pigs, or cattle. Some are kept to breed, and some are kept to grow.

A calf may grow fast, but it doesn't put on much weight that you can sell until it has got some size. So young animals are usually held unless they are surplus, or unpromising.

In cutting trees, it is sometimes different. "I want to cut everything that I can sell."

Wouldn't it be more profitable in most cases to retain a good balanced growing stock of trees, as well as pigs or chickens?

The little trees hardly pay expenses of cutting, anyway. Why not save them for a later cut? Even if

the land is not yours, you may be interested in the cutting, or hauling, some years hence.

The trees left to grow should be straight, and of a fast-growing kind, preferably salable in small sizes, as well as larger ones.

Closely associated with establishment of a satisfactory growing stock is the matter of removing trees that have no promise. This chance of replacing the cripples from old fires by thrifty young trees is available for lands in public ownership as well as for private lands. Of course, there is a limit to the help that any industry can give in clearing up the wreckage of years of neglect on the part of land owners and the public. Pulp-mills cannot use wood unless it is sound and solid, free from certain defects such as charred or rotten places.

Fortunately, however, pulpwood is used in short lengths so that many trees too crooked, or otherwise unfit for use as saw logs, may be worked up into five foot sticks. This is done by "sawing out" crooks, and other defects that would render them useless for saw-logs. Many trees of six to twelve inches diameter have sprouted from stumps or fire-killed stubs. A large proportion of them have small defects in the butt that with the years extend on through the trunk and make them of little value for sawtimber. Until these cripples are cut, the ground is occupied by trees that are not paying their way, and are holding back healthy young growth. A pulpmill that can use the sound parts of such crippled trees offers rehabilitation for such lands. The process will be slow because of the large amount of such wood now present, but each acre so improved is a step ahead.

Foresters sometimes advocate saving choice trees for sawtimber, while thinning out the unpromising ones for pulpwood. It seems more likely that people within economical reach of pulp mills will tend to cut their salable trees of moderate size, at intervals of five to fifteen years, leaving the smaller trees to carry on. Then the less accessible areas will grow the sawlogs, to be harvested at long intervals, perhaps over temporary roads. At any rate, it may be expected that the decision as to the most profitable market will be made by the owners themselves, who are usually quite competent to weigh the advantages and disadvantages of each available market.

Another suggestion we make to farmers especially is to leave off the old practice of fighting encroaching forest growth on worn-out fields. Custom had made farmers think of Virginia scrub pine as a weed, to be exterminated like burdock in the garden. But the worn-out field will not yield crops and the sparse grass now has less promise of value than the once-worthless trees. Old customs change slowly, but they change, if people can see that a change is sensible. It would be impossible to say how much influence our suggestions have had, but the acreage of young trees continues to increase and people do not clear land as much as they once did.

The value of ordinary timber depends more on its accessibility to a market than on its quality. So a logical extension and improvement of the road net from woods to market is a big factor in giving value to forest resources. Thanks to revolutionary improvement in trucks, engendered by strong competition among their makers, the radius from which wood can be hauled direct to the mill has been increased year by year, extending the area over which production for the market is profitable. Thus forestry spreads along the roads.

With proper drainage and surfacing of a large mileage of roads, more and (Continuing on page 124)

MARSH FIREBREAKS - - -

A Boon to Wildlife

. . . By WILLIAM T. COX



Half a million acres of timber is now surrounded by 800 miles of ditches creating safe firebreaks and controlled by dams forming 300,000 acres of duck and beaver marsh

IN THE large swamp areas of Wisconsin and Minnesota, where drainage districts were established some twenty years ago, many farmers are hopelessly stranded. Economic changes have had something to do with this unfortunate circumstance, but the major contributing factor may be found in the working of natural laws—with fire the chief offender.

To begin with, the deep peat lands have proved too difficult to farm on a large scale. The settlers, at best, could expect little more than a modest living from their efforts. But the ever present threat of fire, resulting from overdrainage, has proved the proverbial straw that broke their backs. They lived in terror of fire; they fought fire much of the time. The state governments spent large sums to suppress and control the smoldering peat fires as well as the constantly recurring forest and grassland blazes—but to no avail. Every few years these districts suffered terrific losses from conflagrations that destroyed homes and livestock, that sometimes wiped out whole families.

It has cost Minnesota alone many hundreds of thou-

sands of dollars rehabilitating settlers burned out in these drainage districts.

Not all of the drainage was unwise, of course. There were good districts and bad ones. The sad cases were in the large swamps of deep peat underlain with sand or blue clay and boulders. Such areas were hopeless. One of the worst was the enormous swamp north of Red Lake and east of Thief Lake, in Minnesota. In that territory hundreds of families were stranded until bought out and relocated in good communities by the Bureau of Agricultural Economics of the U. S. Department of Agriculture.

As the settlers were being removed from this great area there was some question as to whether it should be abandoned or developed for conservation. Some felt that the existence of 800 miles of ditches offered an unusual opportunity to create an extensive marsh suited for the breeding of wildfowl, beavers, muskrats and other wildlife. Moose were already in the spruce swamps, and a few caribou remained in the muskeg. Other big game, upland game birds, and fur bearers were also



One of the timber dams, properly built well above the swamp. It was taken over by beavers and increased in height—an ideal condition, for flowage extends four miles up the ditch from the dam, filling many old peat burn-outs

present. A plan was immediately prepared for turning the greater part of the area into one of the largest wildlife areas on the continent. This plan, together with a definite program for development, was in accord with the wishes of the state, and therefore approved by the Department of Agriculture. It was not an expensive program, contemplating spending only one dollar an acre for development. In fact, it has proved to be one of the least expensive projects ever planned and carried out. It took full advantage of the existence of the drainage ditches, at the same time utilizing them as a means to make the whole 800,000 acres safe from fire.

Small and cheap control dams in great numbers were constructed, mostly in 1936, to hold and regulate water in the ditches. These dams were built so as to form a belt of saturated peat, from two to five miles wide and ninety miles long, essentially around the project area. They have worked splendidly.

Since the country is nearly level, there being a slope of from one to several feet to the mile, it was found advisable to build the dams, with their fills rip-rapped at the ends, a little higher than the surrounding swamp. This was designed to safeguard the structures during times of high water and when the beavers were pretty sure to have the gates in the dams plugged to the very top. Water could thus harmlessly pass around the dams through the swamp. Since the surface of the swamp was covered with

a dense growth of sphagnum moss, Labrador tea and other similar binding vegetation, there was practically no chance of its being cut or gullied by the slow-moving water. As a matter of fact, during high water periods the whole swamp becomes essentially a lake and there is little difference in the height of water above and below these ditch dams.

As a result of former fires, there are countless burn-outs of all sizes where the peat has been consumed to varying depths. The locations of the dams have been selected with a view to thoroughly saturating the peat between the

ditches in what we call the "wet firebreak belts," and between the ditches and the more important or better groups of these burn-outs. Thus the burn-outs have become ponds, and these together with the ditches provide many hundreds of miles of shore line skirted with grass and sedges, brush and aspen thickets. In many of the ponds aquatic plants have come in naturally; other choice varieties have been planted for duck, beaver and rat food.

In this way an area of 300,000 acres has been put in ideal condition to serve as a nesting ground for waterfowl. At the same time the area has been converted into the choicest beaver territory on the continent, due to the tremendously long shore line of ponds and ditches and penetrating aspen thickets, the standard food of the beaver.

Every effort has been made to avoid making deep



A dog-team, formerly owned by the author and now used by the State government in wildlife work on the Beltrami Project in Minnesota

ponds since they would be expensive and would complicate matters by introducing a fish problem into a territory where fish would be a decided disadvantage. Some kinds of fish eat young ducks and muskrats. Also, the presence of fishermen at certain times would interfere with the more appropriate and far more important objectives in wildlife management in this particular territory. It happens that Minnesota, with its thousands of lakes, feels little need for developing new fishing places at the expense of less abundant and more valuable wildlife species.



Minnesota Tourist Bureau

Part of the small caribou herd in the Red Lake Wildlife Refuge. Two adult caribou and seven calves were brought in from Saskatchewan to augment the only four then in existence in the United States



Marsh firebreak and duck-nesting area—a shallow pond of 150 acres formed by a dam and low dike across an old drainage ditch. The inset shows baby mallards, splashing gaily about

In the brief time the ditches have been so largely under control—since 1936—the improvement in the Beltrami Project area, as it is now known, and the increase in wildlife have been very striking. Fires have been practically eliminated from what used to be one of the very worst fire districts in the country. In 1936, 1937 and 1938, numerous fires occurred in the territory immediately west of the project, the side of greatest danger since the prevailing westerly winds drive fires, some of which are burning as this is written, to the eastward. But in spite of these fires just outside of the

western boundary of the project, there have been practically no fires in the project area itself. The belts of wet marsh have served to keep them out.

To have constructed upland firebreaks as long as these marshes and through similar territory would have cost several times as much as has been expended on the dams. And even a triple series of ordinary firebreaks would be much less effective than the marshes have proved to be.

The marsh firebreaks, (*Continuing on page 137*)



Courtesy of J. Manweiler

MATCHES FROM IDAHO'S WHITE PINES

By E. F. RAPRAEGER

Photographs by the Forest Service

ONE hundred years ago a New York match manufacturer proudly stated that improvements in his process made it possible to retail matches for a penny apiece. These matches were not only expensive but were poor in quality. When struck they were apt to hiss and sputter or explode like a firecracker. Workers in early match factories became logical candidates for suicide clubs because the deadly chemicals used in making the ignition tip caused ulceration and disintegration of their teeth and jaw bones. Though controlled ventilation in the better factories reduced fatalities, this occupational disease was not eliminated until 1911, when

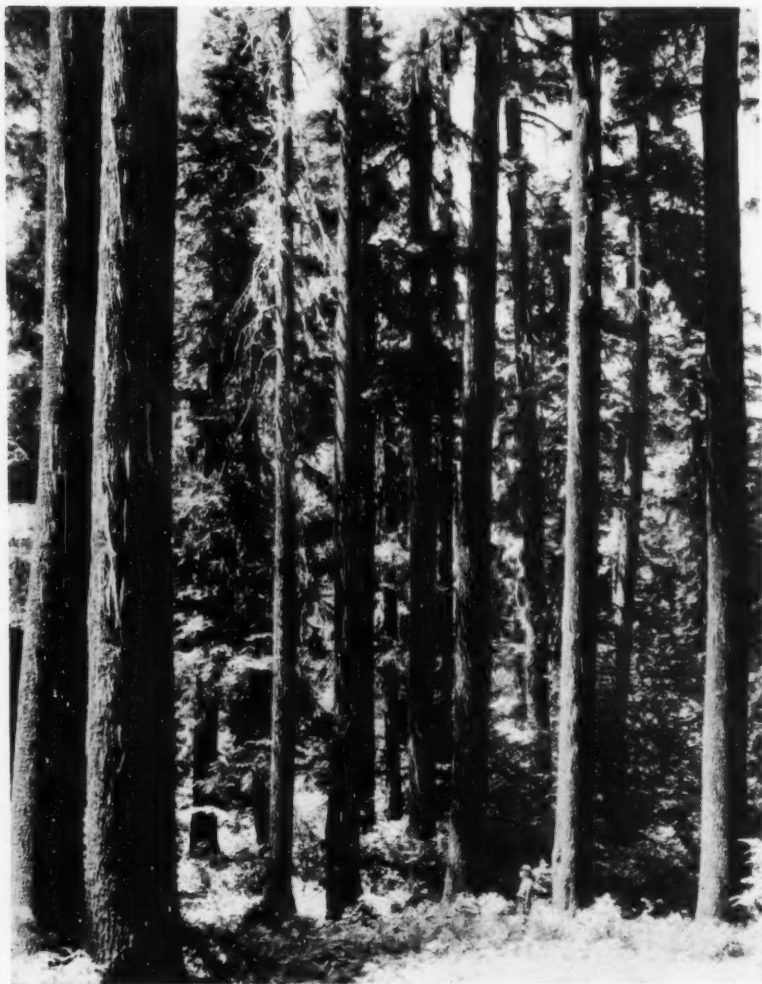
the Diamond Match Company humanely dedicated an exclusive patent for a non-poisonous match, free of royalty forever, to the American people.

A century ago the white pine of the eastern United States was the chief wood used in the manufacture of matches. Today the industry is using mostly pine from the mountains of Idaho. This tree, which scientists named *Pinus monticola*, is commonly called western white pine and, in the lumber trade, Idaho white pine. Tall and graceful, her foliage green and murmuring, white pine is the fair lady of Idaho forests.

The Bureau of the Census reports that 287,000,000,000 wooden matches—2,300 for each person—were manufactured in the United States in 1935. Though the number made from Idaho white pine is not stated, it is known that each year almost 100,000,000 board feet of such lumber, about \$2,500,000 worth, is sold as match plank. From match plank, match blocks are made, and these in turn are made into matches.

Sawmills cut match plank into two-inch and two and a half-inch thicknesses, the two-inch being more common. To be marketable this plank must yield sixty per cent or more of high-grade match blocks—blocks which are light in color, straight-grained, and of the proper texture for splitting into matches. Much match plank is rather knotty because the clear boards cut from logs can be sold for more if used for sash, doors, and home-building.

Although a match is small, it cannot be made from any splinter or piece of wood. Some parts of a log are totally unsuited for matches and match plank. Even the best of timber contains diagonal grain, weak wood, coarse grain, knots, pith, compression wood, hard grain, discoloration, or other imperfections. If an average stand of timber is sawed to obtain the highest possible yield of match plank, the amount seldom exceeds seventy per cent. In most mills the yield is closer to fifty per cent because, as mentioned, the practice is generally



Tall and graceful, her foliage green and murmuring, white pine is the fair lady of Idaho forests



Sufficient logs in a quiet mill pond to make more than fifty billion matches—enough to supply our needs for about the next seven weeks!

followed of making the clear wood into sash, doors, and similar products.

The match blocks are as long as the length of a match. From the gangsaw where cutting into length takes place, these blocks travel on an endless belt to tables and bins where trained choppers, mostly women, chop out the knots, cross-grained parts, and other waste. Good blocks are put in storage bins and the waste is sold for fuel.

The Spokane, Washington, district is a key point for block factories, there being five at Spokane and one each at Bovill and Orofino, Idaho. Blocks are shipped from these points to match factories in other parts of the United States and sometimes to other countries. Most match factories in the United States are located east of the Mississippi River.

A match factory is more than a place

where match blocks are split into matches. There is a mixing room where tons of ground glass, paraffin, and chemicals are handled; there is a box department where thousands of match boxes and shipping containers are made and printed; there is a machine shop for constructing new machinery and repairing the old. Since match factories are few and far apart, each must be an independent operating unit with its own staff of skilled mechanics.

The match machine is an interesting assemblage of wheels, cutting knives, belts, blowers, heated drums, and dip troughs. Machines that the writer saw in operation at one plant were about sixty feet long and seventeen feet high. Blocks were fed into the machine and about fifty minutes later matches came out completed. Each machine had a peak capacity of 750,000 matches an hour.

Blocks are fed into



Gangsaws cut match plank into blocks, as long as the length of a match, and an endless belt carries them to storage bins

the machine by a skilled feeder who carefully watches to see that the cutting knives meet the grain of the wood properly. A row of forty circular knives, flashing up and down at the rate of about five strokes a second, slice off individual match sticks on the downward stroke and on the upward stroke punch each into a perforated steel plate which is part of an endless belt. Look at a wooden match sometime and note the round end which results from being squeezed into the perforation on the belt.

About ninety per cent of each block makes strong match sticks, the balance being waste which consists of choppings, slivers, and "whiskers." Merchantable sticks are carried on the belt through a paraffin bath which increases the sticks' inflammability and through another bath which prevents after-glow. After each bath the belt passes through currents of hot air. The stick now is ready for the inert bulb and ignition tip. These compositions are applied in paste form, and after each coating the sticks pass over heated drums where fans dry the chemicals. Though ordinary friction will not light the inert bulb, the ignition tip lights easily. Its purpose is to convey the flame to the inert bulb, which in turn ignites the paraffin and stick. Safety matches are made by coating the match with one chemical and the box with the other chemical needed to make the fire.

The matches the United States produces in one hour will run into millions—a day's production amounts to a billion. In 1935, considering both wooden and paper matches, the total production was 369,000,000,000—more than a billion a day. Domestic matches are used at the rate of 12,000 a second. Probably no people use more matches than we do.

Though the demand for wooden matches has followed a fairly level course during our lifetime, there has been a tendency for many match-users, cigarette smokers particularly, to favor paper matches in books. Then, too, such books make good advertis-

ing media and are widely used for that purpose by innumerable enterprises. Among other competitors of the wooden match are the electric lighter, the pilot flame on a gas stove, and the fluid lighter ignited by flint and steel. Ironically, the flint and steel which wooden matches displaced a century ago is now regaining some long-lost popularity.

It might make little difference in the lives of many people whether the book match, electric lighter, and fluid lighter displaced the wooden match. Efficient means of making fire would be at hand in contrast with the pre-wooden-match era, when it was necessary to carry coals from the neighbor's house in a bucket or strike a spark from flint and steel into a wad of lint or gun-cotton. The loss of the wooden match industry would make considerable difference, however, in the lives of the people of northern Idaho and Spokane.

It is estimated that the average white pine tree now being logged in Idaho produces somewhat over 300 board feet of commercial lumber plus enough match plank to make a million matches. For making the wooden matches produced in the United States, almost 300,000 mature trees must be cut annually. To supply this want, the pine must be cut from about 12,000 acres—an area two miles wide and about ten miles long. These are not will-o'-the-wisp figures, but reliable calculations based on a careful study of the utilization of Idaho white pine for matches.

Taking into account supply, price, and technical qualities, no wood in the United States is better suited for match manufacture than Idaho white pine. All important match companies draw their supply of match blocks from Idaho. Here is an important industry which provides big payrolls and is willing to pay well for the timber it uses. How long these benefits are continued depends on how wisely Idaho white pine forests are utilized and perpetuated.



THE LONE TREE OF TAMALPAIS

Hail, stalwart Guardian of the barren slope!
Tall sentry of the Lone Tree Trail,
Hale and green thy form as living hope,
Far from thy clustering brethren of the redwood vale.

Through centuries of storm, through summers numberless
Thy arrow shaft, thy vernal feathered blade
Has shot aloft, nor dared the gale the less
Because thy kinsmen in the valley grouped their shade.

Here once a seedling, foundling of the winds,
Fed from this oozing spring of tempests' tears
High on the hillside, now thy rough bark finds
The storm-bred courage of a thousand years.

Athwart the sunset spread thy vernal bars!
Teach thou my soul a strength that shall not fail,
Through night and mist still reaching toward the stars,
O straight and staunch defender of the Lone Tree Trail.
—LEE de FOREST.

MARKETS FOR NEW ENGLAND'S WIND-FELLED FORESTS

By **CARLILE P. WINSLOW**

Director, Forest Products Laboratory, Madison Wisconsin



H. E. Adams

Blown-down timber, salvaged for pulpwood, on the Jefferson Notch Road in New Hampshire—bought from the owners by the United States, and now waiting for a market

IT IS an ill wind that blows nobody good, and if the recent blow-down serves to focus thought and action on the problem of New England's forests, the better utilization and marketing of their products, and the steps needed to develop their long-range social and economic values, it may prove to have been worth all the trees it has cost.

No one can supply a ready-made formula of utilization that will put all the blow-down timber into new uses. It must be apparent that the outlet possibilities for a short period of several years lie primarily in accepted and established forms of use. For the long pull of permanent utilization, however, the development of new uses must play a very significant part.

A very general diagnosis of the emergency shows that New England woods have been supplying only about half the annual lumber requirements of the region—approximately 400 to 500 million board feet from local sources out of a total consumption of 800 million to one billion feet. The difference is shipped in, some from great distances. In nearby New York, New Jersey, and Pennsylvania, some four billion feet are used annually, most of it shipped in; but New England today has practically no share in that great market.

Recognizing that present estimates are far from exact, it may be assumed for the sake of argument that salvageable logs six inches in diameter and larger from the blow-down amount to two billion board feet. On such an assumption, the blow-down would supply New England's total current lumber consumption for two to three years—less or more according to the actual amount found salvageable and the degree of industrial prosperity and lumber demand that may be attained in the meantime. Hence, with a suspension of other forest cutting, it would appear that the salvage situation has possibilities of being largely solved on the basis of current and normal use needs, within the time limit set for the safe ponding of the logs. The situation takes on an even more optimistic aspect by consideration of the fact that just prior to the depression New England was using annually the amount figured for this entire salvage—two billion feet; and today the consumption seems to be again on the rise toward a billion feet or better.

Such a picture may be over-simplified. A closer inspection of the blow-down shows that about fifteen per cent is hardwoods and eighty-five per cent conifers, principally white pine. As to the 300 million feet of hardwoods recoverable, forest survey figures show that

even in the depression year of 1933 hardwoods were being used in New England at the rate of 170 million feet a year in the established run of products—furniture, general millwork, spools and bobbins, woodenware, handles, toys and novelties, and so on down the list to coffins and caskets. Presumably around 100 million feet of the hardwood was local and the rest shipped in. The situation has changed only in that now a three-year supply is already felled and prospectively in storage.

As to pine, the situation is different, because of a continued shrinkage in the last few years in box board markets, a use which consumed the bulk of the 160 million feet of white pine cut in 1933, plus about sixty-five million feet of pine shipped in. On that basis and assuming no diminution since, there is now on hand close

Beyond the industrial zone lies the building field, which is the outlet for more than sixty per cent of all lumber sawed in the United States. Here is the use that offers the greatest opportunity to white pine utilization on the scale now needed.

In the first place, from the technical standpoint, white pine is well suited for most wood construction purposes, provided it is cut to the sizes and grades required. Secondly, there should be an increasing demand for structural material in view of the accumulated housing shortage that exists throughout the nation and especially in the East; in view of the efforts taking shape to meet it and the gathering momentum of building activity and in view of the established use of construction lumber and the universal availability of saw-

ing as a means of converting the logs.

Yet the solution is also complex and difficult, as it involves today a change in outlook and practice with regard to white pine. It will require changes in methods of getting out the logs, general acceptance of log grading standards, improved practice and better organization throughout the manufacturing and merchandising activity.

How many years it has been since any large proportion of New England pine was last sawed into dimension framing I do



H. E. Adams
Great as is the task of clearing up New England's decimated forests—this typical scene is in New Hampshire—greater still is the task of finding markets for the millions of feet of salvaged timber

to a seven year supply; and if a shrinkage of as much as fifty per cent has occurred, a fourteen year supply. Here, then, is the crux of the white pine salvage problem: To further stimulate the use of the available pine for purposes other than box boards.

However radically the picture may be altered in favor of the boxing and crating use by a genuine industrial revival, the outlook in this and other uses should be estimated conservatively. "Other uses" means specifically zones of utilization now held by wood shipped in, but where the local wood will serve.

Most logically New England white pine should find a place in whatever fraction of boxing and crating and other industrial uses is at present being supplied by western and southern woods. Displacement of half of these outside woods would enlarge the market for native pine by possibly twenty per cent.

not know; but I do have a survey showing that fifty per cent of the lumber in small houses goes into this vital but concealed use. Studies of the Forest Products Laboratory show the degree of strength required in joists and studding and how the weakening effect of defects can be allowed for. Under a proper system of grading it is not the number but the size and location of knots that determines the usefulness of the piece for strength purposes. The dimensions of the piece are also to be considered in this regard. In the case of white pine, sawing to full two-inch dimension for joists and studs, instead of the nominal two-inch employed in competitive species, will be practically imperative, along with proper grading for knot size and location.

Other large items in house construction are sheathing, subflooring, and roofers, which, together with framing,



R. S. Burnell

Officials at Conway supervise the work of loading the first New England shipment of down timber by the Northeastern Timber Salvage Administration. Even movietone operators were on hand at Conway to get pictures and sound recordings of the process of shipping this first carload of hurricane damaged logs out of the devastated area

go to make up seventy-five per cent of the lumber bill for the entire house. These covered parts are today all but universally supplied by the lower grades. Siding is a different matter. Knots are virtually prohibited in this item on account of painting difficulties, and clear material will be obtainable only from the exceptional log. Nevertheless, a certain amount of material of siding quality from the down timber is among the possibilities. Beech, birch, maple and oak under

proper working, are all capable of supplying acceptable flooring.

Along with direct construction are many auxiliary and temporary uses, as in concrete form work, false-work for bridges, scaffolding, car bracing, bulkheading, piling, posts, and rough exposed uses in general. They call for much low-grade dimension and common lumber, especially on public works and rehabilitation jobs. Here again proper manufacture and grading of the



R. S. Burnell

The finished car—loaded with New England's famous white pine timber, ready to start on its way to the Forest Products Laboratory at Madison, Wisconsin, for experimental purposes in developing new uses and markets

material with respect to dimensions and the size and location of knots in the piece will count heavily in use.

Full advantage should be taken of public works activities in New England and adjacent areas in the utilization of such material. Thorough canvass should be made of government and other public requirements of this character, in public buildings, water-front structures, flood-control works, CCC camps, and in the metropolitan areas such projects as subway construction, slum clearance and housing operations.

The government's interest in salvaging the down timber is clear, and it should be easy to obtain consideration of the resulting material and cooperation in using it. Equally important in this connection are proper working agreements with the Federal Housing Administration, at present the mainspring of home building. Technical specifications should be studied and, if necessary, adjusted to admit suitable utilization of New England lumber.

The interest and cooperation of the people as well as the government should be enlisted in using New England wood and aiding recovery from a common disaster. The press and the radio will, one feels sure, be ready to extend a helping hand when they are made aware of definite plans and determined purpose in this drive toward a general welfare objective.

Except for spruce and fir in the north country, the species available for salvage have a relatively limited pulp use at present. It is, therefore, doubtful whether any new pulping project should be undertaken in the hope of realizing liquidation values from them.

Nevertheless the pulp outlet should not be neglected. Assuming that the material can be delivered to mills at a sufficiently low price there is a possibility of disposing of some hardwood material, including birch, beech, maple, and aspen, and probably elm, ash, and other species, for soda pulping. These species are now used in three soda pulp mills in Maine, one in Massachusetts, and four in New York. Birch, beech and maple, and also aspen, are being utilized for sulphite pulp, particularly in the grades used for book and tissue papers, and for rayon and viscose films—mills manufacturing these hardwood sulphite pulps being located in Maine, New Hampshire and New York. So far as I am aware, no hardwoods are being utilized for mechanical pulp in the New England area. This use presents certain possibilities, as there are a large number of groundwood mills throughout the region.

Available technical information indicates that white pine is suitable for the production of strong brown kraft pulp, a material of which there is already a large supply from the South. The only New England kraft mill is in Maine. There is also evidence that white pine can be reduced by the soda-sulphur pulping process for book-grade pulp and is also amenable to grinding to board grades and possibly higher grades of mechanical pulp. No data are at hand regarding its reduction by the sulphite process, but this may be practicable if carefully selected heart-free wood is employed.

Looking over utilization possibilities by and large, any successful program of disposal must be based from the first on an analytical survey of the eastern wood-using industries here at New England's door—a survey that will show what their requirements are, and why; and how New England material can meet them now.

Many angles of the disposal problem can be solved only by intensive investigation. Fuel wood, for in-

stance, offers some possibilities for salvage of the smaller material, but nobody yet knows whether it can be managed on a big scale at a profit, who will use it, or how to prepare it mechanically at minimum cost. There are many interesting ideas on the subject, but they need working out on the ground.

Railway ties are another outlet that is apparently choked at present. Oak is the species most favored, but the New England roads are stocked for a year or so ahead. To make any impression at all on the blow-down through this channel will probably require an extension of government credit, and acceptance of ties in all grades meeting the technical specifications.

An outstanding problem of lumber salvage is the provision of small sawmill equipment that will retrieve maximum values with minimum waste. The introduction of bandsawing in portable mills might greatly benefit production. An outfit designed and built for this purpose is now nearly ready for tests at the Forest Products Laboratory, at Madison, Wisconsin. If successful in a preliminary way, the blow-down area would be an ideal proving ground for the new system in hard service.

As a further possibility, in line with the government's general policy of furthering international trade, it would seem that consideration might be given by the proper agencies with the State Departments to dispose of some of the material to be acquired by the government to other nations in need of wood. To my knowledge, within the past year pine pulpwood has been bought in central Europe for as much as \$15 a cord at the mill, and spruce aboard ship in Maine has been bought by German users at \$9 a cord.

Finally, supposing that the situation should threaten an unwieldy surplus of lumber, the possibility that the government itself might saw and store at least part of the material as a measure of national defense preparedness is suggested for consideration. In an emergency, the possession of an adequate supply of pine for structural and container use would be a prime asset, as those of us can testify who witnessed the terrific scramble for such material in 1917. Alongside the two billion dollar power program and other great developments which are now sanctioned in the interest of national defense, this measure may be only incidental, yet eventually justified.

Although the blow-down emergency has brought acute problems, in three to four years these should have disappeared; on the other hand, to capture and hold the full economic and social values possible from the great forest resources of New England, the problems of utilization, like the historic poor, will be always present.

From available figures, it seems entirely feasible to produce, ultimately, from the forest lands in the north-eastern states an annual crop aggregating two billion board feet. While this is more or less the amount now to be salvaged, it is no larger than the wood consumption requirement in New England in such years as 1928. Superficially, then, it might appear that all that is needed to solve the wood use problem is a return of prosperity. But again the solution is not so simple.

In the first place, it will be many years before the depleted forest lands can supply an annual growth of size and quality to meet the structural and industrial demands of former standards. Much of the material that will be available will be small in size and knotty in character, and if it is (*Continuing on page 141*)

EDITORIAL



THE FOREST-PARK CONFLICT

THE appeal of the Directors of The American Forestry Association to the President and to Congress for a cessation of bureau warfare in the administration and development of the national forests and national parks is one which, it is hoped, may have the support of other conservation groups. The national forests and parks, as this column has often stressed, are the most important conservation accomplishments of our government. Both systems have their very definite places and purposes. These purposes can be made to serve public interests in the highest degree only through a broad policy of coordination and mutual acceptance by the bureaus concerned of such adjustments from time to time as changing conditions and national needs may dictate.

Quite the reverse is the case today. Important questions arising between the two bureaus, particularly if they involve national forest territory, lead invariably to open hostilities with partisan broadsides of propaganda that confuse the public and create lasting animosities. This obviously is bad administration. It abridges the first principles of national planning. It lowers the morale and efficiency of public service and it gives no assurance that natural resource policies are being developed in those directions that in the long run will be for the greatest public good.

The situation is the natural outgrowth of the development of two systems of federal reservations located in many instances side by side, fundamentally different in purpose but with no marked difference in physical characteristics on large portions of the area or in problems of maintenance, operation and improvement. In their early years, the national parks were made up of areas of such outstanding distinction, scenically and scientifically, that there was no argument over their exclusive dedication to the enjoyment of the public. The situation changed, however, with the increased construction of highways, use of automobiles and expansion of outdoor recreation. This brought to both the parks and forests visitors in constantly increasing numbers and with them a growing public demand, often local, for more parks, more roads, and more facilities to accommodate the public. The same era brought out the recreational possibilities of the national forests and made recreation a major problem of administration. In increasing millions, people went to the national forests for their outdoor vacations and the Forest Service was hard put in many instances to provide facilities for them.

The development of recreation on a large scale marked the beginning of serious conflict between the two systems. The conception of a great chain of parks embracing areas of scenic, historic, scientific, educational and recreational interest throughout the country was evolved. This larger program led to diligent search for new park

areas. It was only natural that the Park Service turned to the national forests which contain abundant mountain scenery of high quality, beautiful forests and streams and other attractions for recreational visitors. It was only natural too that the Forest Service which had the national forests well organized under long-range plans of management should protest against proposed disruption of its territory and plans.

The conflict has grown steadily more aggravating until today the two Services are in a state of almost constant hostility over questions of territory. Opinions and attitudes in both bureaus have hardened until reconciliation of policy by ordinary means of conference and agreement seem out of the question. Last winter it was war over the Olympics. This winter it is war over Kings River Canyon. From the standpoint of the public whose interests are involved, the situation has reached an intolerable stage. The American Forestry Association believes firmly in the national forest and park undertakings. It has always supported both and it wants to continue to do so as their policies and services merit. But it cannot do so effectively, fairly or with honor when administration is based on the bureau principles of "to the victor belongs the spoils."

We think that many other conservation organizations feel the same way. After all, the national parks and national forests—and this the two bureaus sometimes seem to forget—are owned and supported by the nation with the end in view of providing the largest continuous service to all the people. The two systems embrace natural resources of great importance to the economic, industrial and social life of the regions in which they are located. It is pertinent to inquire whether the dual system as at present organized and administered, operating side by side and without adequate coordination of policy, is in actual fact meeting the requirements of efficient administration and highest public service.

The Directors of The American Forestry Association therefore propose that the whole administrative question of federally owned parks, forests, forage and wildlife be subjected to a critical study by an impartial, non-governmental agency. It suggests that this study be made by a committee representing the National Academy of Sciences. In the meantime it would have the President and Congress declare an armistice between the National Forest and Park Services until the study in question is completed. In view of the fact that the resources which the two bureaus are warring over are already fully protected and will remain so, an armistice would be in the interest of sound, long-range administration and would jeopardize nothing except the rivalries of the two belligerent Services.

DISEASE ATTACKS THE PERSIMMON



As strikingly shown by the trees on the right, the disease becomes evident by wilting and yellowing leaves and general thinning of the foliage

TWO years ago a number of dying American persimmon trees in the central basin of Tennessee were brought to the attention of the Division of Forest Pathology of the federal Bureau of Plant Industry. Investigation revealed that they were victims of a wilt disease, the exact identity of which is as yet unknown, and that fatal attacks have been going on in that region since 1936. Indeed, local residents stated that trees had been dying in Tennessee since 1931.

Surveys made in 1937 and 1938 show that the disease now occurs at least in eastern Mississippi, north and south Alabama, northwest and southeast Georgia, southern South Carolina, and in Florida as far south as Tampa. Rather scanty exploration reveals that the distribution of the disease is resolved into three somewhat indefinite areas—one centering in north central Florida, another in western Florida, and a third in central Tennessee. In each of these regions dead trees have been found which give evidence of the presence of the disease as far back as 1936.

The most striking symptoms of this disease are wilting and yellowing of the leaves, usually appearing in the topmost branches about the end of May and rapidly spreading throughout the whole tree. Fine brownish-black streaks are usually found in at least five or six of the outer annual rings of the wood of the trunk, branches, and the roots of the affected tree. A tree infected too late in the fall for its current-season foliage to be affected will often bear small, light colored, or chlorotic leaves the following spring; later these wilt and fall. Affected trees may drop their leaves in the middle of the summer and stand covered with half grown fruit.

From these diseased trees a fungus has been isolated, has been grown in pure culture, and has produced the disease when inoculated into healthy trees. It is an undescribed species of *Cephalosporium*, related to, but not identical with, the one which causes a die-back in the American elm. This causal organism, *Cephalosporium*, is an imperfect fungus of which no sexual stage is yet known.

The fungus spores apparently enter the tree by means of wounds, such as leaf sears and broken and insect-girdled twigs. At first the spores seem to be distributed through the tree in the sap stream.

Outbreak Spreads Over Large Southern Area as Science Seeks Its Cause and Cure

By R. KENT BEATTIE and
BOWEN S. CRANDALL

The fungus eventually reaches the wood surface where pinkish spore masses are produced in abundance under the loosening bark of the dying tree. As the bark loosens and falls off, these masses of pinkish spores are revealed and rapidly disappear. They are very tiny and easily carried by the wind. Thereafter, the trunk of such a tree is quickly attacked by the rot fungus, *Schizophyllum commune*, and within a few months is so



Wilt-killed persimmons look not unlike chestnuts killed by the blight

AMERICAN FORESTS

completely decayed as to fall to the ground. Large cracks frequently form in the wood of the most rapidly dying trees, simulating cracks caused in trees by frost.

The American persimmon, *Diospyros virginiana*, belongs to the botanical genus *Diospyros*. It has two related species in the United States: *Diospyros texana*, with blackish fruits, extends from Mexico into Texas; *Diospyros mosieri* has been described as a shrubby persimmon from south central Florida. Neither *Diospyros texana* nor *Diospyros mosieri* has been tested and nothing is known concerning their susceptibility to this disease, which is not yet known to occur in their natural region.

The Oriental persimmon, *Diospyros kaki*, has numer-

recent months. From one of these, not too far decayed, the *Cephalosporium* which causes persimmon wilt was isolated. The disease also occurs in American persimmon trees volunteering in the same orchard.

In the Orient, and sometimes in the United States, *Diospyros lotus* is used as a stock on which to graft the *kaki*. This persimmon has been inoculated and infected, and a few of the trees wilted and died. In some of the trees which did not wilt, black streaks appeared from which the inoculated fungus was cultured.

There are about 200 other species of the genus *Diospyros*, nearly all of which are tropical or subtropical. Some, occurring in tropical Asia and Africa, are producers of the ebony of commerce. None of these have been tested and their susceptibility to the disease is un-



Fine, brownish-black streaks are found in the wood of trunks and branches and outer annual rings



The rot - fungus (*Schizophyllum commune*) rapidly attacks and completely destroys the wilt-killed trees



The fungus produces spore masses very abundantly under the loosening bark of its dying victims

ous cultivated varieties and is a very important fruit tree in China and Japan. It has been introduced fairly extensively into this country, being grown chiefly in California and the states bordering the Gulf of Mexico.

Preliminary inoculation work indicates that the disease can be introduced into the *kaki* and that in some cases, where this species is growing grafted on American roots, the trees will wilt and sometimes die. The disease seems to kill the tree after it has gone down through the *kaki* into the American roots. Black streaks usually develop in the wood of the *kaki* and the fungus has been recultured in some instances, both from streaked and unstreaked *kaki* wood. *Kaki* persimmons growing on their own roots have not yet been tested.

A large part of the American persimmon fruit industry uses *kaki* grafted on American stocks. In one *kaki* orchard in Florida a number of trees have died in

known. It is not likely that other genera in the ebony family enter into this problem.

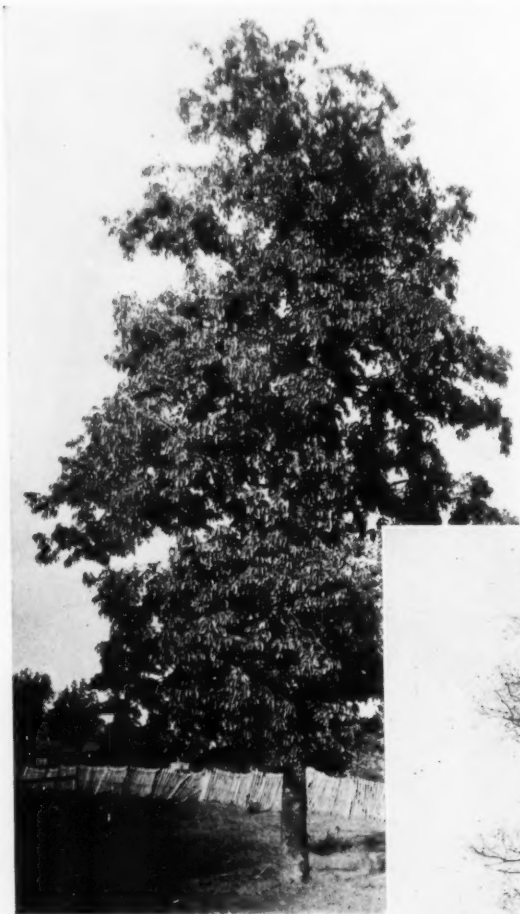
Throughout most of its range the American persimmon occurs in more or less isolated groups consisting of single clusters or fields filled with small scattered groves. When this disease is introduced into such a field it spreads rapidly from tree to tree and from clump to clump, and in a few years the persimmon has disappeared. Over most of the diseased area as now known, the infected trees are few, are scattered and are surrounded by trees still healthy. Such areas appear to have been recently infected.

Thus far, it has not been possible to trace the disease to any specific centers of infection. No specific evidence of the source, place, or time of its introduction is yet at hand. No record of its causal fungus has been found in other countries, but (*Continuing on page 124*)

PERSIMMON

Diospyros virginiana, Linnaeus

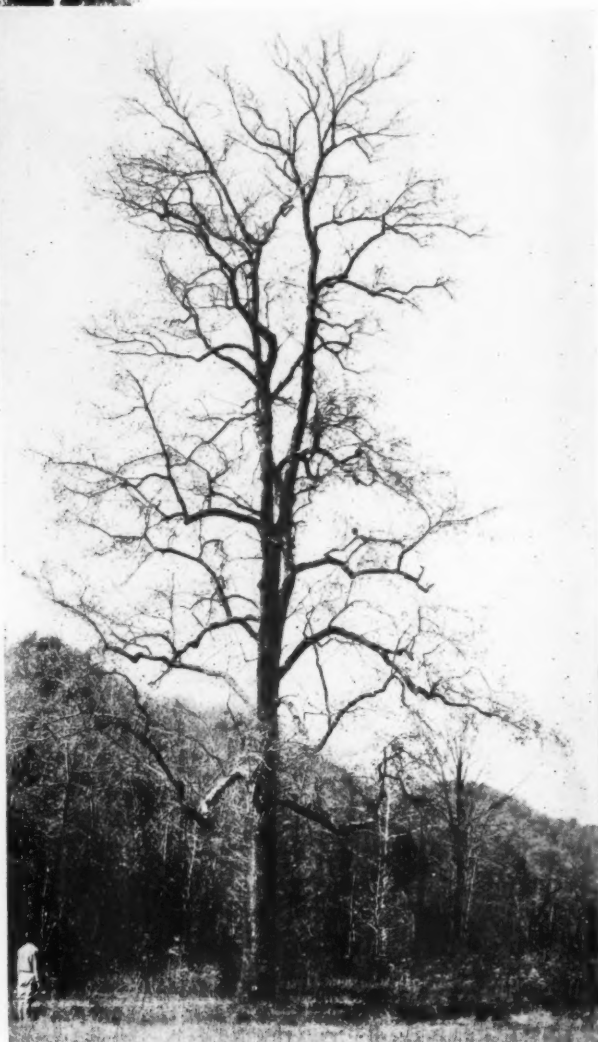
BY G. H. COLLINGWOOD



Ohio Forest Service

A TREE of moderate size, with crooked branches and a round topped cylindrical crown massed with glossy leaves, the persimmon is the most northern member of the ebony family. It is, however, more generally known for the puckery quality of its immature fruit than for its hard, firm wood. While other true ebonies are largely tropical or subtropical, this tree grows on a wide variety of soils and sites from Connecticut westward through southern Pennsylvania to southeastern Iowa, eastern Kansas, and south throughout Texas and Florida. Only one other species of persimmon, *Diospyros Texana*, occurs in the United States. This is of no commercial importance, and its range is limited to southwestern Texas.

A tree of moderate height whose irregular branches may be clothed with glossy leaves



Frequently a large shrub, forming extensive thickets on abandoned land, it often attains heights of fifty feet and trunk diameters of six to twelve inches. Under favorable forest conditions it reaches 100 to 130 feet in height with trunk diameters of over two feet.

The leathery, alternate leaves are pointedly oval, three to seven inches long, and a deep, glossy green above contrasting with a pale under side. The leaf stems or petioles are one-half an inch to an inch long. Sheep, goats, and even deer will not browse the foliage, so this tree successfully maintains itself on open land and frequently prospers in spite of pasturing.

In May or June while the leaves are partly grown, yellowish green to milky white urn-shaped blossoms appear like small bells on

the new shoots. The staminate blossoms are usually on one tree and the pistillate ones on another, so there are fruit bearing trees as distinguished from those which are apparently barren.

The fruit is a true berry, roughly globular and an inch to an inch and a half in diameter, with one to eight oblong, compressed seeds imbedded in the juicy flesh. Early settlers are reported to have roasted the seeds for use as coffee. Early in summer the big berries are pale orange and often red cheeked, but when dead ripe turn a blackish purple. Only then does the pulp lose its high content of astringent tannin to become sweet and delicious, with food value only second to the date.

In the same locality are trees with fruits which ripen from August or September into February or even March. Thus persimmons furnish food for birds and wildlife as well as for such domestic stock as hogs, and to some extent for humans through the fall and winter. Trees begin to bear fruit early and continue with regularity, often weighing down the branches with as much as they can support. The quality varies with different trees, some fruits being especially adapted for food, and all being capable of being reproduced through grafting or budding.

The name *Diospyros* is from two Greek words—*Dios*, which refers to the god Zeus, and *puros*, for wheat. Literally it is "food for the gods," which refers to the luscious fruits of the 200 or more varieties of persimmon. *Virginiana* refers to that great area of eastern North America named for Elizabeth, "the virgin Queen" and known as Virginia to DeSoto, who described the fruit in 1557 as a "delicious little plum."

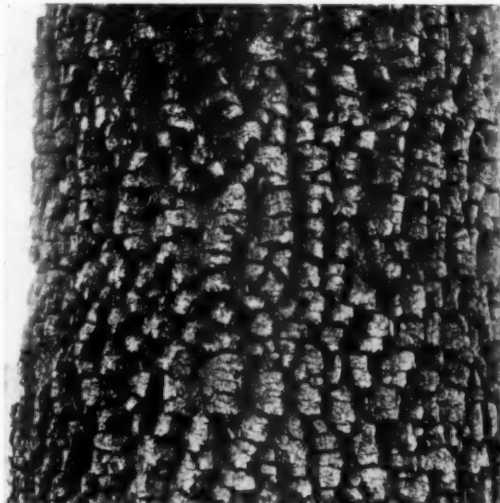
The deep brown to black bark is closely divided into small blocks like a rough mosaic. It is an inch and a half to two inches thick.

Like other members of the ebony family, the heartwood of persimmon is dark brown or black, while the larger area of light brown sapwood is often mottled with darker spots. Comparatively little sapwood turns to heartwood until trees are close to 100 years old. The wood is close grained, hard, strong and tough, weighs about fifty-three pounds to the cubic foot when air dry, and is capable of taking a high polish. The sapwood is chosen for use as shuttle blocks, bobbins, plane stocks, and shoe lasts, is recognized as standard for the heads of golf clubs, and has other less specialized uses.

While susceptible to injury from ground fires, it is seldom seriously attacked by insects and is avoided by livestock and rabbits. A recently discovered fungus disease, known as persimmon wilt, is, however, causing severe losses throughout many portions of its range. As yet too little is known regarding the life history or possible spread of this disease to prophesy its effect on the persimmon trees of the country. Until more is known concerning this fungus and its control, the use of persimmon as a holder of the soil and as a source of food for animals or men may be left largely to nature.



The leaves are glossy green above and pale beneath, while the fruit is a large berry



The dark brown bark is deeply cut into small blocks



Natural range of Persimmon

Taking Forestry to the Woods

(Continued from page 108)

more of the forest land is becoming accessible in winter, as well as in good weather, and gradually we are coming to a spread of the marketing period to cover the year round, instead of a limited season of favorable weather. Year-round income from wood makes the practice of forestry more and more worth while, as it tends to supply regular, as opposed to seasonal employment.

Now that you have read the outline of what we have tried to do, it is pertinent to ask, "What about the cutting areas? Could a forester look at them without weeping?" He could, if he is not too emotional. It might be hard to find a model area where everything is just so, as prescribed for the public park of some European village. Foresters should not be reproached for their love of order.

Old maids share this passion with soldiers and sailors. It is perfectly respectable and perfectly red-blooded. Only it shouldn't be carried too far. The busy shop has shavings on the floor. The point is that progress is being made toward establishment of full production on the forest areas where wood is being cut.

And it may be more important to help the people concerned to evolve sound ideas than to press for spectacular "before and after" effects in the woods. In figuring how to handle a piece of woods, the owner must of necessity consider his own situation and needs, as well as what will be best for his trees or for the land. Foresters in their eagerness for quick results, should not overlook the effects on people of policies they advocate.

People are vastly more important than

trees. In our eagerness to make a fine showing in the woods, we must be careful not to rob people of their means of living a satisfactory life today. Maintenance of individual initiative among the citizens is a more worthy goal than sustained yield. There is no reason apparent in nature why freedom of action and sustained yield cannot both be attained, with patience and understanding.

At Covington, we are helping private owners to reorganize their remaining holdings on a sustained yield basis. There has never been any resort to threat or coercion. Perhaps a little light has been thrown, but certainly no heat. To the extent that this selling effort is successful, the objectives of sound forestry are in the way of being accomplished, without public cost, and with immediate benefit to a large number of people.

Disease Attacks the Persimmon

(Continued from page 121)

it is difficult to identify positively a fungus for which the perfect stage is not known. If it is a mild parasite of the *kaki* introduced from the Orient, which has attacked with virulence the American persimmon under the conditions in our southern states, we might expect to find some evidence of the disease in California. But there the *kaki* is given an exceptionally clean bill of health. The area of distribution of this disease does not seem to coincide with the entry and movement of ebony logs from the Asian and African tropics. Thus the origin of the disease is still a mystery.

What will the disease do to the American persimmon? This tree is found in that part of the United States southeast of a line from Connecticut to Nebraska and south to the Gulf. The disease is known from central Tennessee southward and eastward, approximately over the

southeast quarter of the persimmon area. As yet there is no evidence whether it will move further north. Even in the infected area it is too early to know whether there are individual trees which can be selected and propagated to form a resistant variety. What would be the result of crossing the American and Asiatic persimmon is yet unknown. All are problems for the future. Will the American persimmon follow the American chestnut into oblivion? No one knows.

But why save the American persimmon? Many farmers consider it one of their worst tree weeds. Much labor must be expended to eradicate it from their cultivated ground. But it is this very persistence that gives the tree one of its great values. The American people are awakening to the absolute necessity of soil conservation. In some regions the

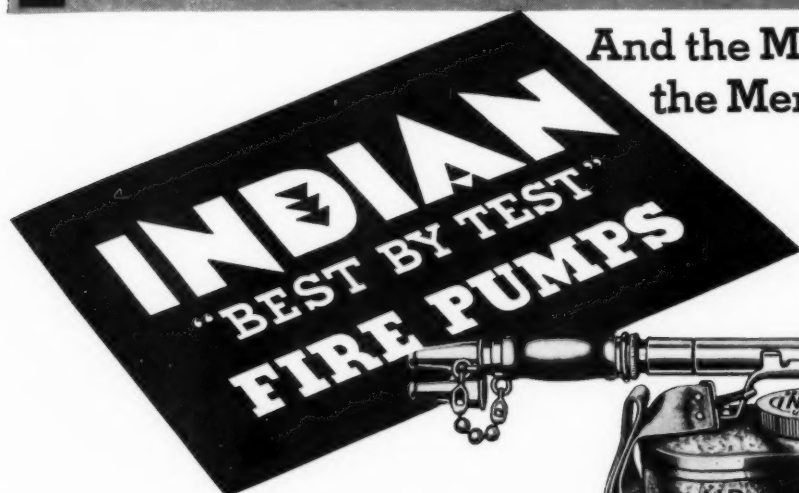
persimmon is one of the first and best of the trees to help stop erosion on certain worn-out soils. The rapid growth and abundant propagation of the tree help to bring back quickly the brush and forest cover. Its early and abundant fruiting furnishes a considerable food supply to wild game, fur bearers and to some farm animals. Individual trees ripen their fruits at different times, thus furnishing an almost continuous autumn and winter food supply.

As a lumber tree the use of the persimmon is very specialized. Large persimmon trees are most abundant in the wet bottom lands of the Mississippi and its main tributaries from north Tennessee to Louisiana and Texas. The lumber is close grained and is mostly used for golf stick heads, shuttle blocks, and other small specialties. It commands a high price and would be difficult to replace.

TREES AND THEIR USES—No. 40—PERSIMMON



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WOOD AS A PAVING MATERIAL

BY N. V. FELSEVANYI

WOOD has been employed in the construction of roadways from the earliest times. Excavations on the sites of lost civilizations have brought to light roads built with wood that even today are in splendid condition. Primitive people in the swamps of the jungle use wood to make firm paths on the trembling earth, and pioneers carrying civilization into the savage regions make their first roads with the natural material lying at hand—wood. The resiliency of wood has been proved by railway engineers to render it the very best material for sleeping cars, and in the search for a material for the streets of the great cities, the paviours took advantage of this experience and evolved the now familiar wood-block pavement.

Wood-block pavement is one of the principal materials used in a number of great cities, especially in London and Paris. Its use, however, has in the past been limited by climatic conditions. Where there are heavy snowfalls and long periods when the temperature is below zero, the water that is bound to percolate into the joints and under the wooden surface will freeze. The resultant expansion causes the road surface to bulge and become dangerous to traffic. Also, in Germany, where wood-blocks are used to some extent on bridges, it has been found that the surface reacts unfavorably to the expansion and contraction of the steel forming the frame of the bridge.

Recent developments in the technique of wood-block construction have evolved a new form of tongued and grooved block which permits of the necessary play between the individual blocks, but this of necessity increases the cost of production, which is already high. Another disadvantage of this form of wood pavement is that only high grade northern pine

that has been thoroughly impregnated can be employed, another factor adding to high costs. Too, a concrete bed is essential. These economic and technical difficulties long prevented wood coming into its own as a paving material, especially in smaller towns and villages. As a result, the advantages of wood paving—its elasticity, silencing effect on traffic, and long life under heavy service conditions—had to be dispensed with.

In recognition of the fact that wood was undoubtedly an ideal material for road surfaces, and in an effort to find an outlet for the enormous quantities of

as the name implies, the surface consists of both wood and stone. The wood is in the forms of cylindrical blocks, ranging from four to ten inches in height, which are cut from saplings and other undersized timber, preferably hardwood, with diameters of from two to five inches. This process of cutting takes place on the site by means of a transportable circular or band saw, often driven with wood gas, and it is obvious that it is extremely cheap, especially in the case of roads being built through or near forests. After being cut to the requisite lengths and barked, the cylinders are impregnated on

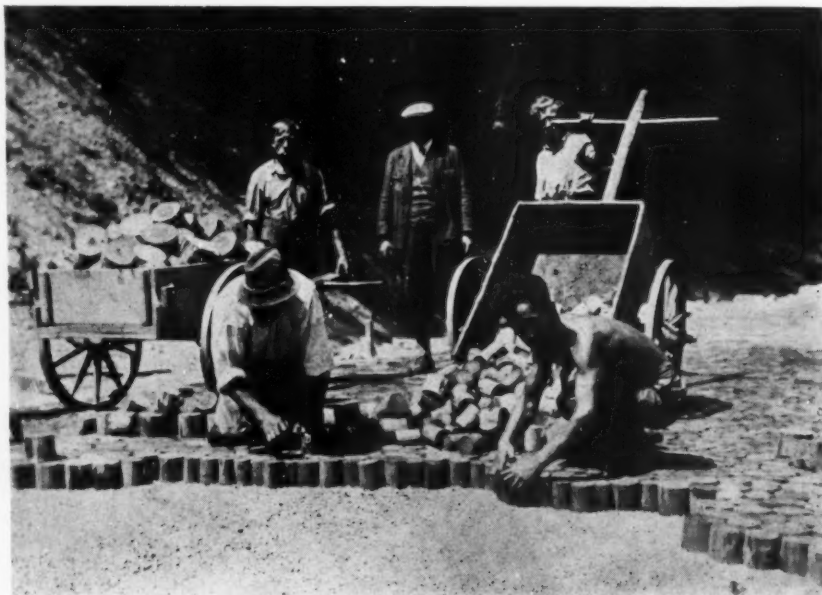
the spot, immediately prior to laying, by being dipped in a travelling vat of Wolman salts, which are soluble in water.

In the case of simple farm roads, the ground is levelled and strewn with a thin layer of gravel. The wooden cylinders, still wet from impregnation, are placed upright on this bed and rammed or rolled in. The gaps between the blocks are filled with stone chips and the whole is again rolled so that the blocks are forced into the bed and the chips bite into the wood to

form a homogeneous surface that is fit for light duty at once.

It should be mentioned that the edges of the tracks are formed by ramming split wood billets about eight inches long into the ground with the flat sides outwards. These edges are rolled at the same time as the road surface so that a firm unit is assured. The rolling takes place while the road is being sprayed with water. The surface may be improved by filling the gaps with an asphalt-tar emulsion and strewing the surface with fine chips that are rolled into the exposed tops of the cylinders, thus forming a waterproof and durable surface. In roads

(Continuing on page 143)



Laying the cylindrical wood blocks

low grade and undersized timber unsuitable for ordinary commercial purposes, a Dr. Deidesheimer, of Berlin, invented a new method of road paving, which possesses all the advantages of the wood-block system and none of its drawbacks.

This method dispenses with the complicated creosote impregnation plant and machinery by which the wood-blocks have to be cut to exact dimensions, and requires but the simplest of transportable plant and unskilled labor for the actual laying. It is eminently suitable for all types of surfaces.

The Deidesheimer method of road surfacing, patented in most European countries, is called "wood-stone" paving, and

Overripe Forests

The volume of useful timber in overripe forests rapidly declines with the passing of time. Mature and overripe trees decay and die in common with all plant life. Unless timber is harvested at the proper time, much potentially valuable building material is wasted. While this loss in itself is great, unharvested ripe timber causes further waste in our natural resources by holding back new growth.

Weyerhaeuser timber operations are scientifically adapted to meet this condition and to handle "timber as a crop".



JOHN D. CRESS PHOTO

WEYERHAEUSER SALES COMPANY

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THE NORTHWEST TIMBER INDUSTRY COMMITS HARA-KIRI

By AXEL H. OXHOLM

As this is written, I am watching from my window in Tacoma, Washington, the loading of a Japanese vessel. It is taking on part cargo of 1,200,000 feet of choice Douglas fir peeler logs. This is a daily occurrence in the Northwest, and we have seen how one foreign market after another has changed from the importation of plywood, lumber, and other manufactured forest products and are now buying our logs. These logs have been cut from the cream of our virgin forests. No other country in the world can furnish this material. That is the reason why Japanese, Italian and German boats go half way around the world to secure these supplies.

These logs not only represent the most profitable item in Northwest logging, but they also offer the most important potential source of employment to our labor. Consider this 1,200,000 feet of logs now being loaded for Japan. At the most, in cutting the timber and preparing the logs for export, American labor received \$5,000 in wages. Had these logs gone to the plywood mill right across the waterway, our labor would have received not

less than \$60,000 in wages. Therefore, by exporting these logs, we, in reality, made the Japanese a present of \$55,000 in employment opportunity.

This is only one phase of a suicidal export policy. It took nature from 300 to 700 years to grow the timber from which these logs were cut. The timber can never be replaced on a commercial basis. On the other hand, everyone, knowing the conditions in the Northwest, appreciates the fact that future reforestation enterprises must largely be paid out of the profits realized from the cutting of old growth timber of this type. A premature exhaustion of these virgin timber resources is inevitable if we keep on exporting 100,000,000 feet a year. If we continue this unrestricted exportation of this irreplaceable natural resource, we will hamper commercial reforestation and in many instances make it financially impossible. These virgin timber resources must eventually be cut, but it is of national interest to string out the supply as far as possible, and at least to reserve this class of timber for our own industries and for our own labor.

There is no parallel example in any civilized country where a natural resource of this type is permitted to be exported. Germany, Italy, and many other nations have even gone so far as to prohibit the importation of American Douglas fir plywood, but at the same time giving every facility for the importation of our logs. Germany has even gone further, adding insult to injury, by paying for the logs in terms of veneer knives, wire rope, and other highly manufactured steel products, thereby displacing additional American labor. It goes without saying that American ships do not even secure an opportunity to transport these logs which move on subsidized foreign lines.

A bill has been introduced in Congress at this session for the purpose of prohibiting the exportation of Douglas fir peeler logs. This bill should have the support of all true conservationists. Its passage will signify a turning point in our export trade since it will be the first step toward the development of an intelligent export policy relating to forest products.

FARM FORESTRY VS. FORESTRY FARMING

The distinction between farm forestry and forest farming promises to mark the boundaries of responsibilities for the Soil Conservation Service and the Forest Service in the "stream-lined" reorganization of the Department of Agriculture.

To clarify the statement of October 6, 1938, Secretary Wallace issued a new memorandum on January 31, 1939. The direction of all *farm forestry* programs financed under authority of the Cooperative Farm Forestry Act is assigned to the Soil Conservation Service, but the Secretary warns that this "does not authorize and should not cause the development of a second forestry agency."

No changes are contemplated in the existing responsibilities of the Forest Service "for the administration of the national forestry program, including any *forest farming* program," cooperative forest protection, research, or production of forest planting stock.

The Prairie States Forestry Project, for which no regular appropriation is included in the present budget, will continue under the direction of the Forest Service, as long as it is financed with emergency funds. He suggested "that the policies followed by the Forest Service in the administration of this project be consistent with the general *farm forestry* program for the nation and that it should be developed in the light of the needs of other land-use programs in this area."

The Secretary's prohibition against the development of a "second forestry agency" is not clear as the responsibility for

directing, planning, and organizing a farm forestry program is definitely placed upon the Soil Conservation Service, but in exercising its function, co-operation is required with the Forest Service and such other bureaus in the Department as the Extension Service. In warning against a "second forestry agency," the Secretary obviously intends to avoid duplicating such work as that of the Forest Service in research, nursery production, or forest protection. Accordingly, he refrains from setting up an organization to carry out similar functions in the Soil Conservation Service. Thus, forestry can no longer be considered a one-bureau function.

The Soil Conservation Service has the responsibility for developing a unified and harmonious Department of Agriculture-State Forester-State College farm forestry program with the advice of a farm forestry committee in the Department to include representatives of the Forest Service, Soil Conservation Service, Extension Service, and the Bureau of Agricultural Economics, with a chairman selected from the office of Land Use Coordination.

Estimates now before Congress for a \$600,000 appropriation for the Norris-Doxey Cooperative Farm Forestry Act indicate that this money must be matched on a fifty-fifty basis by state agencies or individuals. If granted, \$100,000 may be used to supplement the \$100,000 requested for the cooperative production and distribution of forest planting stock now authorized under the Clarke-McNary Act, and both funds totaling \$200,000 will be allocated to state forestry agen-

cies through the Forest Service, for the production of stock at existing nurseries. Another sum of \$100,000 may be added to an equal amount now recommended for farm forestry extension work in co-operation with the land-grant colleges.

The heart of the Department's farm forestry program to be administered by the Soil Conservation Service, is the initiation of projects for which \$400,000 is tentatively allocated. These are visualized as land use and soil conservation projects located in various parts of the country with special emphasis on farm forestry. The Department expects to continue them for twenty years or more in cooperation with state agencies so they will be equally useful to state foresters and extension foresters. Future farm forestry programs may well be based on these foundations.

The farm forestry projects may be selected by a special committee to be set up in each state whose membership would include the State Forester, Director of Extension and others.

Farm forestry, to which the Soil Conservation Service will direct its efforts, is defined as having to do with the "farm woodland." This in turn is interpreted as "any forest or potential forest land on farms, or operated in connection with farms, where the economy of the entire farm holding is based primarily on production of other than forest crops."

As the federal subject-matter authority in forestry, the Forest Service will deal with forest farming on "non-farm forest land," whose economy is based primarily on forest land and its products.

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March 22, 1939

TO arouse the public to take greater responsibility for the protection of forests, wildlife and other natural resources from fire, The American Forestry Association in cooperation with other conservation organizations will inaugurate this month an educational campaign designed to stop some of the 175,000 forest fires that yearly are laying waste our lands.

As a means of focusing attention on this vital question, the Association's 64th annual meeting is being concentrated in a single event — a NATIONAL FOREST FIRE PREVENTION DINNER to be held at the Mayflower Hotel, Washington, D. C., on the evening of March 22. The public is cordially invited.

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AFA Directors Ask Settlement of Bureau Conflicts

The Board of Directors of The American Forestry Association, meeting in Washington January 20, decided to propose to President Roosevelt and the Congress that a special study be made of federally owned resources of primary value for forests, parks, forage and wildlife looking to redetermination of policies of administration and settlement of present bureau conflicts and disputes in the handling of these resources. The Directors were moved to action by the feeling that the present situation as respects bureau conflicts, particularly those arising in the administration of the national forests and national parks, have reached a point that may be jeopardizing public interest and reacting to the injury of the conservation movement.

Included in the Board's action is a proposal that controversial questions between bureaus be set aside until the study of the management and administration of the resources in question in the light of present day conditions has been completed. It proposes that this study be made by the National Academy of Sciences which in 1896 made the initial study of public timber-lands which today forms the basis of much of the government's administrative policy.

The action of the Board was incorporated in the following resolutions:

That the President or Congress be requested to call upon the National

Academy of Sciences to study and make recommendations as to the policy to be followed by the government in the management and administration of federally owned resources of primary value for forests, parks, forage and wildlife.

That pending the completion of such a study, The American Forestry Association urges that no action be taken on controversial questions involving boundaries or jurisdiction of federally owned resources involved in the study.

The Directors also declared themselves in favor of modification of the present policy of the Department of Agriculture in administration of the AAA in respect to farm forestry. As now carried out farmers in forest regions can get benefits only on the basis of the area of crop land on the farm. The Directors voted to support the principle of including forest land as a part of the acreage to be used in determining benefit payments when the land had been planted or otherwise brought under forest management of approved standards.

After study of H. R. 800, a bill recently introduced in Congress by Representative Fulmer of South Carolina and designed to give the Secretary of Agriculture authority to take over private forest lands for management and reforestation, the Directors went on record as believing the bill to be impracticable.

Wildlife Restoration Week—March 19-25

At the time of year when even the dweller in the crowded city becomes acutely aware of woods and fields and streams, the American people will again be told of the urgent necessity for sustaining a program which has for its purpose the restoration of the wasted riches of our continent, for the second National Wildlife Restoration Week, sponsored by the National Wildlife Federation, is about to be observed throughout the nation. Through press and radio and many publishing channels emphasis will be laid on the thought that the restoration of our natural resources is our best national defense.

President Roosevelt last year issued the proclamation of the first National Wildlife Restoration Week with an ap-

peal to all citizens, "first to recognize the importance of the problem of conservation of these assets in wildlife, and then to work with one accord for their proper protection and preservation."

The Wildlife Poster Stamps for 1939 are beautiful and carry brilliant representations of eighty different species of wildlife. Through the sale of these Wildlife Poster Stamps in connection with Wildlife Restoration Week the National Federation helps to finance state and local conservation activities, and maintains its own headquarters. They are priced at \$1.00 a sheet of eighty stamps and may be secured by application to the National Wildlife Federation, Investment Building, Washington, D. C.

New Regional Foresters Named

Transfers affecting three regional forest offices were announced today by F. A. Silcox, Chief of the Forest Service, U. S. Department of Agriculture.

C. J. Buck, regional forester of the North Pacific Region which includes the States of Washington and Oregon with headquarters in Portland, Oregon, is being transferred to the Washington office of the Forest Service in the capacity of general inspector and special assistant to the Chief in various major phases of the work of the Forest Service.

Buck will be succeeded as regional forester at Portland by Lyle F. Watts, at present regional forester of the North Central Region which includes the States of North Dakota, Minnesota, Wisconsin, Michigan, Iowa, Illinois, Indiana, Ohio, and Missouri, with headquarters at Milwaukee, Wisconsin.

Jay H. Price, at present associate regional forester of the California region with headquarters in San Francisco, will become regional forester in the North Central Region.

Gabrielson Reports Increased Wildfowl

Warning that there is still great need for restraint in hunting and for adopting somewhat drastic regulations and for enforcing them effectively, Ira N. Gabrielson, chief of the Bureau of the Biological Survey, in his report for the fiscal year ending June 30, 1938, states that for the third consecutive year, an increase in waterfowl has been noted. "This year," he declares, "the prospects are the best the birds have had since their recent precipitous decline. Some liberalization in the regulations, therefore, has been possible, so as to distribute more equitably such hunting as can be allowed. The restrictions may seem unjust to some hunters, but it is to be remembered that an adequate game-law-

enforcement program is necessary if waterfowl hunting is to be perpetuated."

The wildlife restoration program of the Bureau is described as fundamentally one of land utilization. In this regard, Dr. Gabrielson reports the addition of seventeen new units to the system of national wildlife refuges. This brings the total in the United States to 232, comprising 7,557,221 acres, together with 4,093,137 acres in the sixteen units located in Alaska, Hawaii, and Puerto Rico. Funds totaling \$780,000 from the sale of the Migratory Bird Hunting stamps are supplemented with emergency relief allotments in making these purchases possible.

Waltonians to Meet in Chicago

The Izaak Walton League of America will hold its national 1939 convention at the Congress Hotel, Chicago, March 16, 17 and 18. One of the subjects that is to be featured at the convention is aquatic waterway values which have been commonly ignored by private and governmental agencies in the development

of public projects. Among the speakers will be J. N. Darling, President of the National Wildlife Federation, Aldo Leopold, professor of game management of the University of Wisconsin, and Dr. John Van Oosten, in charge of Great Lakes fisheries investigations for the United States Bureau of Fisheries.

New England Fire Prevention Provisions

A special conservation program for the areas of New England and Long Island damaged by the September hurricane has been announced by Secretary of Agriculture Henry A. Wallace.

It establishes additional farm forestry practice supplementing that provided in the 1939 Agricultural Conservation Program. Payments for this practice will be in addition to those provided by the conservation program, and will be at the rate of \$4 per acre of farm woodland which constitutes a serious fire hazard as a result of hurricane damage. The maximum payment for any farm will be \$60. These payments may be earned by cleaning up woodlands to permit new growths. Performance will be supervised by County AAA Committees to assure that approved farm forestry practices are followed.

The Forest Service has warned of the danger of forest fires, as disastrous as the hurricane itself, unless the slash and

debris is removed. Estimates of the Forest Service place the amount of timber blown down by the September storm at 4,000,000,000 board feet, which is eight times the average annual cut in New England. Nearly half of the farmland in the area damaged by the storm is in timber which contributes substantially to the farm income of New England. Scenic and recreational attractions of the New England forests also bring millions of dollars annually to the region in tourist business.

The area in which the new farm forestry practice applies includes: New Hampshire; Rhode Island; Massachusetts, except Barnstable and Berkshire counties; Connecticut, except Fairfield and Litchfield counties; Cumberland, Oxford, and York counties in Maine; Caledonia, Chittenden, Essex, Franklin, Lamoille, Orleans, Orange, Washington, Windham and Windsor counties in Vermont; Nassau and Suffolk counties on Long Island, New York.

Minnesota Approves Land Exchanges

Several hundred thousand acres of state lands, scattered throughout the areas marked for additions to the Superior and Chippewa National Forests, will be exchanged for outlying federal land which the state needs for addition to forests and game refuges, under authority of an amendment to the Minnesota State Constitution, adopted at the last election.

Exchanges can be completed after receiving the approval of the state executive council, consisting of the Governor, Attorney General, State Auditor, Secretary of State, and the State Treasurer, and provide that all mineral rights on the lands will be reserved to the state.

The amendment also permits the relocation of settlers on the unproductive cut-over areas, and authorizes the reforestation of some 5,000,000 acres of tax delinquent lands which have reverted to the state as well as other extensive areas which are unfit for agriculture. By this means the state and the several counties may be relieved of heavy tax burdens now necessary to maintain schools and roads in sparsely settled, submarginal regions. To effect the reforestation program, a federal WPA grant of \$1,500,000 has been approved to the Minnesota State Division of Forestry.

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National Forest Commission Purchases Lands

The purchase of 290,203 acres within forty-nine national forests and purchase units was approved January 26, by the National Forest Reservation Commission. The tracts receiving the favorable consideration of the Commission are located in twenty-four states and Puerto Rico and will be administered by the federal Forest Service.

The acquisition, involving a total cost of \$1,415,568, includes 70,623 acres in the Appalachian area, 37,379 acres in the Southern region, and 153,626 acres in the Central and Lake States. Areas offered by present owners for national forest purposes extend from Santa Rosa Sound, in western Florida, to the international boundary waters, in northern Minnesota.

The Commission also approved an initial purchase of 6,251 acres of virgin redwood in Del Norte County, California, and 11,265 acres of mature ponderosa pine in central Oregon.

The Commission ratified recess approval to abandon the Grand River Purchase Unit established in Iowa in 1935, but in which no purchases have been made. Lands within this unit are included in a submarginal land development program of the Soil Conservation Service.

The purchase program permits the consolidation of wildlife management areas on the Nantahala and Talladega National Forests, in North Carolina and Alabama.

A purchase of 4,947 acres in the Arrowrock Unit, near Boise, Idaho, was approved to supplement the Boise National

Forest area on the Arrowrock Reservoir watershed, making possible measures to reduce sedimentation which threatens to shorten the lifetime of the Boise reclamation project.

The 11,265-acre purchase on the east slope of the Cascade Mountains, adjacent to the Deschutes National Forest, near Bend, Oregon, is the initial step by the Commission to supplement the ponderosa pine stumpage already owned by the United States tributary to Bend. By additional purchases the Commission hopes to avert the eventual collapse of the lumber industry upon which the city depends.

In advancing the proposal, Chief Forester F. A. Silcox and Robert W. Sawyer, editor of the Bend *Bulletin*, explained that federal intervention to assure sustained yield cutting operations on both public and privately owned timberlands tributary to Bend was essential to the future existence of the city.

A Commission rule that purchases would not be approved in units where less than twenty per cent of the land had been purchased was waived in the Little Sciota and Symmes Creek Purchase Units, in Ohio, to permit the purchase of 993 acres needed to protect the Vesuvius Lake watershed.

In addition to their future value for timber production, the purchases will consolidate areas for administration, fire control, and recreational use, aid in regulating grazing, reduce silting in reservoirs, and help to eliminate poaching on game refuges within National Forests.

CCC Dons New Uniform

A new spruce green uniform will be issued to Civilian Conservation Corps enrollees beginning October 1, 1939.

Robert Fechner, director of the Civilian Conservation Corps, has long felt that the adoption of a first class, distinctive uniform which enrollees could wear when not at work would be a good thing for the Corps, would build up morale and improve the appearance of the boys.

Now the Director's hope has been realized and he has authorized the issuance of the new uni-



CCC Boy Takes the "Once Over"

form to enrollees in CCC camps located in the first, second and third corps areas. The new uniform will be issued to enrollees in the remaining six corps areas as stocks now on hand are exhausted.

Senior Leader Frank Papuga, of Martin, Pennsylvania, shown on the right in the photograph, is an enrollee in CCC Camp NP-7, Fort Dupont, Benning, D. C., and is proudly wearing the new uniform. Robert Alesandrine, left, of Windsor, Pennsylvania, also in Camp NP-7, wears the old uniform.

Record to Head Yale School of Forestry

Henry S. Graves, Dean of the Yale School of Forestry, Provost of the University in 1923-27, and a member of the faculty for thirty-one years, will retire from active service at the end of the present college year, President Charles Seymour announced on February 15. Mr. Graves will be succeeded as Dean of the School by Dr. Samuel J. Record, Professor of Forest Products at Yale since 1917.

Dean Graves has been a leader of American forestry for the past forty years and is internationally known for his distinguished services in that field. For many years he has been a director of The American Forestry Association and on two different occasions has served as its president (see page 100). Dr. Record, who will succeed him as head of the School of Forestry, has been a member of the School's faculty since 1910. In 1917 he was promoted to the chair of Professor of Forest Products, which position he has since held.

Dean Graves graduated from Yale College in 1892, and after taking a special course in forestry at Harvard for a year, carried on investigations in forestry in the field, and then spent a year abroad studying at the University of Munich. In 1898 he entered government service as assistant chief of the Division of Forestry in the Department of Agriculture, and remained there until 1900, when he was called to Yale to organize the School of Forestry. He served as Director of the School until 1910, when he was appointed Chief of the United States Forest Service. In 1920 he resigned from government service and for two years was engaged in the practice of his profession as a consulting forester. Since 1922 he has been Dean of the School of Forestry at Yale and Sterling Professor of Forestry.

Harvard, Lincoln Memorial University, and Syracuse University have conferred honorary degrees upon Dean Graves. He has served as president of the American Forestry Association, and of the Society of American Foresters, and has been an officer in numerous other organizations interested in the conservation of natural resources. The Henry S. Graves Redwood Grove in California, named in his honor, was dedicated in September, 1926.

Professor Record, who will assume office on July 1, is a graduate of Wabash College, and received the Master of Forestry degree from Yale in 1905. Before joining the Yale School of Forestry he was the first Supervisor of the Arkansas

and Ozark National Forests. He is a wood anatomist of international repute and has been chiefly responsible for the development of Yale's studies in tropical woods. Under his direction, the Yale collection of woods of the world has become the largest and most comprehensive, and now contains more than 36,000 specimens representing 11,100 different species. Numerous species and two genera of tropical American trees have been named for Professor Record, who is the founder and editor of the journal *Tropical Woods*. He was secretary of the organizing committee of the International Association of Wood Anatomists, and is the author of "Timbers of

Tropical America," several textbooks and a large number of important scientific and professional papers.



Samuel J. Record



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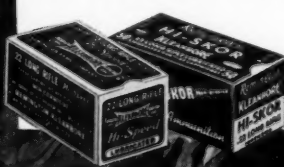
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Shade trees have many hazards which we can't avoid, but if they are thoughtfully chosen in the first place, planted properly and given intelligent aftercare, there is little reason to expect serious trouble except from general catastrophes such as New Englanders experienced last year. No tree can be expected to withstand a hurricane successfully if it is directly in the path of the storm, but many troubles can be avoided through intelligent tree selection.

If you are one of those fortunate individuals who has an ample area to plant, ideal growing conditions, and plenty of money with which to experiment, you have little to worry about. But choosing a single shade tree for the average small home lawn is not the simple task it might first appear to be.

Oh, to be sure, you can go to a nearby nursery and, after scouting around a little, choose a tree which appeals to you. But if you happen to pick out a tree which is ideally suited for its location by this method, you are just lucky.

Trees vary so much in their environmental requirements, resistance to insects and disease, hardiness, strength, longevity, size and beauty that considerable care is needed

to choose just the right tree for a particular spot.

We don't have the space here to consider the many species of trees which are adapted to the varied conditions found in all parts of the country, but we can give some consideration to the principles which govern intelligent tree selection anywhere from Maine to California. For our purpose, suppose we consider these principles under four major headings—*site, species, size and selection.*

First, we want to be sure that whatever tree we finally select will not only exist but actually thrive when it is planted. Primary consideration, then, should be given to a thorough understanding of the many environmental factors which affect the planting site. What is the physical character of the soil—sand, loam, clay, or perhaps a variety of these? What degree of soil acidity is present? Is soil moisture abundant or scarce? What is

the annual amount and distribution of rainfall? What extremes of heat, cold and wind should be anticipated? What serious insects and diseases are prevalent or imminent and likely to attack certain species? Will the tree be subjected to harmful atmospheric gases, smoke, soot, or other unfavorable city conditions? All these and other local environmental factors should be thoroughly investigated, for trees vary widely in their adaptability to soils, moisture conditions and extremes of temperature, and their resistance to insects, disease, wind and soot. Some species are adapted to wide variations of site and climate but more, perhaps, will thrive only under definitely favorable environments.

If you want to know what trees are best suited to your site, look around you—look at your neighbors' trees. In most cases the data is yours for the taking, and you will be assisted in choosing wisely

if you eliminate from further consideration those species which show their unsuitability to local conditions by their weak growth, chewed, or sickly looking leaves and scraggly appearance.

In most cases, species native to the locality are the safest choice, but even some of these are ready prey to insects and disease. Certainly the newer varieties of the old standbys and recent introductions are worthy of serious consideration, particularly for the larger lawns.

But choosing a single tree for a particular site is more than a matter of eliminating those which are unsuited to the environment. The choice should always be a positive



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For an important shade tree on a large lawn, few species are the equal of the majestic white oak

rather than a negative one and should be based largely on the appearance of the tree and the purpose it is to serve, immediately after planting and through the years to come. Practicality is essential, of course, but it need not be sacrificed in choosing a species whose appearance and esthetic values are particularly well adapted to a certain site.

Charles W. Barr, writing in Michigan State College Extension Bulletin No. 160, *Ornamental Trees*, states that, "In general, the following rules may be used as a guide in tree selection, although particular problems may require special treatment: First, the important trees on a large lawn, or adjacent to a large building should be tall, large-limbed and heavily foliated types; second, the small private area should have small trees that will give a pleasing floral picture, or a fine foliage background for the other flowering plants; third, the bright colored trees should be used sparingly and only as special accents; fourth, if there is room for only one tree, it should not be one with colored foliage, but a well-shaped tree with good green foliage."

Lists of recommended trees for sites like yours are available from most of the state agricultural experimental stations. Consultation with such a list, together with your own observations, should give you a pretty good idea of the species you want to plant.

Perhaps you are wondering just how big a tree should be to start with. Today, this problem is easily solved by the size of the family pocketbook. If cost is not a paramount consideration, plant a fairly good sized tree by all means. It will give you immediate shade and a feeling of stability and age to your grounds. But if dollars must be counted, yours can be the joy of planting a sapling and watching it develop and grow before your eyes. Modern equipment makes the moving of a forty-foot tree child's play, and almost any sized tree can be safely moved by a competent arborist—but at a price commensurate with the size. So count your pennies before you make up your mind.

When you are ready to select your tree go to the most reliable arborist or nurseryman you can find, tell him what you want, and place the job in his hands. Let him guide the final selection of an individual tree of the species you want. His judgment must be relied upon—unless you are an expert—to select a tree which is structurally sound, in a vigorous condition, free from serious insect and disease pests, and which has a well balanced crown and root system. You may get a cheaper quotation from someone else, but you no doubt will get just about what you pay for. Trees are like everything else in this respect—and it takes more than a glib tongue and a low price to select good trees and make them thrive.

Now, go and choose your tree, but bear in mind the four S's—*Site, Species, Size and Selection*—and you will have something of which to be proud—a thing of beauty and a joy forever!

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LUMBER—ITS MANUFACTURE AND DISTRIBUTION, by Ralph C. Bryant. Published by John Wiley and Sons, Inc., New York City. Illustrated. 535 pages. Price \$5.00.

Revised, brought up to date, and generally improved without increasing its bulk or approximate number of words is the achievement of Professor Ralph C. Bryant in bringing out a second edition of his text book on "Lumber." Marked progress in the principles of lumber manufacture and the relations which the industry bears to labor, together with a new series of lumber statistics, have been developed during the past sixteen years. The more pertinent of all of these are included in the revisions so that the volume may maintain its place as the standard college text book on "Lumber—Its Manufacture and Distribution."

THE CALIFORNIA WOODPECKER AND I, by William Emerson Ritter. Published by the University of California Press, Berkeley. Illustrated. 340 pages. Price \$3.50.

Wherein a nontechnical discussion evolves around the kinship between man and his feathered friends—mainly the woodpecker. An unusual, theoretical, thought-provoking comparison.

GARDENING INDOORS, by F. F. Rockwell and Esther C. Grayson. Published by the Macmillan Company, 60 Fifth Avenue, New York City. 201 pages. Illustrated. Price \$2.50.

Without becoming too technical for the amateur gardener, the authors give some valuable information and instructions on the care and development of indoor plants. From miniature cactus gardens to elaborate window box arrangements the hobby of indoor gardening is thoroughly covered.

PLEASURES AND PROBLEMS OF A ROCK GARDEN, by Louise Beebe Wilder. Published by the Garden City Publishing Company, Inc., Garden City, New York. Illustrated. 294 pages. Price \$1.98.

An informative and instructive reference containing everything essential for planning and maintaining effective rock gardens.

THE BOOK OF WILD PETS, by Clifford B. Moore. Published by G. P. Putnam's Sons, 2 West 45th Street, New York, N. Y. 553 pages. Illustrated. Price, \$5.00.

A small encyclopedia on the collection, care, and feeding of small wildlife. Teachers and parents, boys, girls, and other folks will find the book worthwhile and helpful.

LEARN THE TREES FROM LEAF PRINTS, by David S. Marx, Cincinnati, Ohio. Paper Bound Edition \$1.00, DeLuxe Cloth Bound Edition \$2.50.

Shows the natural size, characteristic outline, and detailed vein pattern of 161 broadleaf trees and shrubs common to the eastern half of the United States. The thirty-two plates of this spiral bound volume are note-book size.

NEW BOOKS and OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request. Books on this list—as well as other books—may be purchased at a discount of ten per cent from published prices if they are ordered through the Association.

AN INTRODUCTION TO AMERICAN FORESTRY, by Shirley Walter Allen. Published by McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York, N. Y. Illustrated. 402 pages. Price \$3.50.

Forestry as the "building up, setting in order, and keeping in order a forest business" is described with a gratifying quality of the graphic by Shirley W. Allen in "An Introduction to American Forestry." True to its title, it is an "introduction," giving recognition in its twenty-one chapters to the soil from which the forest springs, the enemies that beset it, and the means of promoting, protecting, and harvesting the crop.

Those seeking to evaluate forestry as a choice of life work will find this book helpfully informative, students will welcome the author's ability to lift factual writing out of the realm of dullness, and the two chapters on "Forestry as a Public Policy" will long serve as a helpful reference to students of political science and land use, as well as to foresters.

BIRDS OF THE PACIFIC COAST, by Willard Ayres Eliot. Published by G. P. Putnam's Sons, 2 West 45th Street, New York City. 211 pages, with fifty-six color plates by R. Bruce Horsfall. Price \$3.50.

The 118 birds listed and described, following the classification and nomenclature of the 1910 Check List of the American Ornithologists' Union, represent thirty-seven families. Many of those described are found as far east as the Rocky Mountains—some even as far as the Mississippi Valley. The colored plates show the males in full breeding plumage, but where the females differ radically in color, they are also shown.

United States Pulp and Paper Industry, by James D. Studley—published by U. S. Dept. of Commerce as Trade Promotion Series—No. 182. Supt. of Documents, Washington, D. C., price 15 cents.

The Cutting and Selling of Pulpwood—published by the South Carolina State Forest Service, Columbia, S. C.

Factors Affecting Establishment of Douglas Fir Seedlings, by Leo A. Isaac—Forest Service, U. S. Dept. of Agriculture, Circ. No. 486. Supt. of Documents, Washington, D. C., 10 cents.

Index of Research Projects, W.P.A., Volume 1, being the results of some 2,000 research projects carried on as part of the federal work relief program. Published by the Works Progress Administration, Washington, D. C.

Substitute Spray Materials, by S. A. McCrory and C. G. Vinson. Research Bulletin 292, College of Agriculture, University of Missouri, Columbia, Mo.

Twenty-seventh Annual Report of the State Forester of Oregon—J. W. Ferguson, State Forester, Salem, Oregon.

Terracing an Important Step in Erosion Control, by Marian Clark and J. C. Wooley. Agricultural Experiment Station Bulletin 400, University of Missouri, Columbia, Mo.

Report of Lands, Parks, and Forests Branch, Department of Mines and Resources of Canada, Ottawa, Canada.

Drought of 1936, by John C. Hoyt. Water Supply Paper 820, Geological Survey, U. S. Dept. of Interior, Supt. of Documents, Washington, D. C. 15 cents.

Recreation Directory of Massachusetts State Parks and Forests, Department of Conservation, Boston, Mass.

Service Letters, Pennsylvania Dept. of Forests and Waters, Harrisburg, Pa.

Wood Preserving News—American Wood Preservers' Association, Chicago, Ill.

Rural Land Use Activities in Missouri, by Ross J. Silkett. Agricultural Exp. Station Bulletin 399, University of Missouri, Columbia, Mo.

Relation of Birds to the Establishment of Longleaf Pine Seedlings in Southern Missouri, by Thomas D. Burleigh. Occasional Paper 75 of the Southern Forest Experiment Station, New Orleans, La.

Botanical Gardens, by John Davidson. The University of British Columbia, Vancouver, B. C.

Zeitschrift für Weltforstwirtschaft (Journal of World Forestry)—Director, Prof. Ing. F. Heske, des Institutes für ausländische und koloniale Forstwirtschaft, Tharandt i. Sa., Germany.

International Review on Timber Utilization, No. 1, "Timber for Structures"—Comité International du Bois, Brussels, Belgium.

Marsh Firebreaks

(Continued from page 111)

they are, were not designed solely for fire protection. They were also intended to serve as breeding grounds for wildlife, and their value in this respect has been just as strikingly demonstrated.

Previous to their damming, the ditches were dry except for a few weeks in early spring. Under such conditions very few ducks nested in the territory.

Since the dams have been built beavers have gone upstream, or rather "up ditch," and have constructed many dams of their own. They have also taken possession of the dams built by the government, and in many cases have raised them six inches to a foot or more. The increase in the beaver population has been notable. There are now fully twice as many of these valuable animals in this district as there were three years ago. Deer have increased rapidly, so have the elk; and even the moose have been gaining.

The last remaining band of woodland caribou in the United States is found in this project area. These splendid animals, resembling reindeer though somewhat larger, have been declining in number ever since the big swamp country was drained. A year ago the last bull disappeared and only three cows remained. The restoration of swamp conditions, which made the territory again favorable for caribou, encouraged us to make a final effort to replenish the band. Interest was aroused. A small allotment was obtained from the Farm Security Administration, and with the permission of the Dominion of Canada and the Province of Saskatchewan, ten caribou of the same species were captured in the forest north of Prince Albert. In this enterprise we had the active assistance of the Hudson's Bay Company and the cooperation of the Federal Biological Survey and the State of Minnesota. The animals brought in are doing exceptionally well and give promise of saving the woodland caribou from becoming extinct in the United States.

But the most tremendous increase in wildlife is noted in the case of waterfowl. From the few pairs of mallards that used to nest around the occasional beaver ponds or along the Rapid River pools, there are now literally hundreds of thousands of ducks, of eight or nine species, hatching in these marshes—constituting what is probably the largest consolidated wildfowl nesting area in the country.

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12 to 18 in.	25.00	Japanese Red Pine 4 yr. Transplants, 8 to 15 in.	15.00
Scotch Pine 4 yr. Transplants		Jack Pine 5 yr. Transplants	
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Jack Pine 5 yr. Transplants		Red Pine 6 yr. Transplants	
12 to 18 in.	20.00	12 to 18 in.	15.00
Jack Pine 3 yr. Transplants		Scotch Pine 6 yr. Transplants	
6 to 12 in.	15.00	18 to 24 in.	20.00
White Pine 4 yr. Transplants		Scotch Pine 5 yr. Transplants	
4 to 10 in.	20.00	12 to 18 in.	12.00
Japanese Red Pine 4 yr. Transplants, 8 to 15 in.	25.00	White Pine 4 yr. Transplants	
Norway Spruce 4 yr. Transplants		4 to 10 in.	15.00
4 to 10 in.	16.00	Colorado Blue Spruce 5 yr. Transplants, 4 to 8 in.	15.00
Red Spruce 6 yr. Transplants		Norway Spruce 5 yr. Transplants	
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White Spruce 5 yr. Transplants		Red Spruce 6 yr. Transplants	
6 to 12 in.	20.00	6 to 12 in.	10.00
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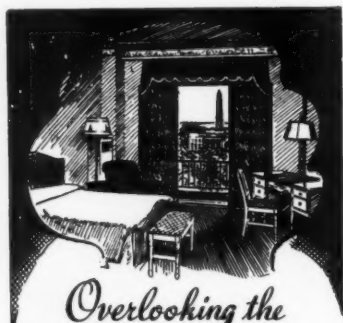
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FORESTRY IN CONGRESS

By G. H. Collingwood

New England congressmen, vying with their western colleagues, described property damage and potential forest fire hazard resulting from last September's hurricane and the devastation of grasshopper plagues. Both groups succeeded in restoring the recommendations of the Bureau of the Budget when the Senate passed the First Deficiency Appropriation bill on February 6.

To clear up roadways and trails, restore fire towers and telephone lines, and otherwise reduce the fire hazard in the New England hurricane area, \$5,000,000 is included in the bill. The original Forest Service request to the Bureau of the Budget was \$7,740,000, but the House approved only \$3,000,000. Also included is \$500,000 toward salvaging some 200,000,000 board feet of wind damaged timber on 200,000 acres of the White Mountain National Forest, for which the Forest Service originally requested \$1,100,000.

Neither house heeded the Budget recommendations of \$200,000 for Dutch elm disease eradication, although the request of the Bureau of Entomology and Plant Quarantine was \$365,000. The President has recommended that next year's regular appropriation be increased to \$778,489. However, unless additional money is included in the Second Deficiency Appropriation bill, the recent WPA allotment of \$1,065,500 to complete this fiscal year may have only the small remainder of the regular appropriation of \$378,489 for its supervision.

The Independent Offices Appropriation bill passed the House on February 8, 1939, with \$295,000,000 to continue 1,500 Civilian Conservation Corps camps. Available surpluses permitted the Corps to function this year with \$286,500,000, but Director Fechner anticipates large purchases of motor equipment and clothing, together with the moving of 316 camps because nearby work projects have been completed.

With legal authority for the C.C.C. expiring on July 1, 1940, Senator Thomas of Utah has introduced S. 1110 to make the C.C.C. permanent, bring some 26,000 of the personnel under civil service, and give the Corps an official seal. The civil service proposal would not affect reserve officers, enrollees, or unskilled laborers. Public hearings are promised on a similar bill, H.R. 2990, introduced by Representative Mary T. Norton, of New Jersey, Chairman of the House Committee on Labor. Neither bill includes provisions for military training, but such proposals are covered in S. 1182, introduced by Senator Reynolds of North Carolina.

Included in appropriations for the Tennessee Valley Administration are \$564,000 for forestry, erosion control, fish and game preservation, and recreational development. Plans for the coming year anticipate the planting of 15,000,000 to 20,000,000 trees, construction of several thousand check dams for erosion control, and active participation in fire protection.

Hearings before two House subcommittees for the consideration of appropriations for the Department of Agriculture and the Department of the Interior were started early in February.

A proposal to set aside 454,600 acres in the California Sierra region as the John Muir-Kings Canyon National Park was introduced on February 7 by Representative Gearhart of California as H.R. 3794. Differing only in detail from the "Kings Canyon National Park" bill of last session, it would include the General Grant National Park, about 4,080 acres in the Redwood Mountain for whose purchase S. 631, introduced by Senator Murray, of Montana, would authorize the Secretary of the Interior to pay \$460 an acre, and some 440,000 acres now in the Sequoia National Forest contiguous to the north boundary of the Sequoia National Park. Tehipite Valley and the lower Kings Canyon are excluded for reservoir sites, with the proviso that if abandoned the President may add these areas to the park. No road will extend beyond the canyon floor of the South Fork, where shelters and provisions for the entertainment of visitors are to be confined. On the remainder of the area the wilderness character will be preserved.

Recommendation that these lands be permanently retained in national forest status where they will be open for full use, rather than to be included in the park, was voiced in a Senate Joint Resolution passed by the California legislature on January 9, 1939.

Continued appropriations for white pine blister rust control are authorized in H.R. 3406, introduced by Representative Lea of California, and S. 1262, by Senator Johnson of California. The House Committee on Agriculture has promised hearings.

Press reports indicate that Representative Lindsay Warren's relatively non-controversial bill for the reorganization of the federal government will contain no proposal for the creation of any special cabinet position for conservation, welfare, or public works. That something will be introduced, however, is assured by recent extension of authority to the two committees on government organization.

CONSERVATION CALENDAR

Important Bills in Congress with Action
January 11 - February 10, 1939

APPROPRIATIONS

- S. 1265—BYRNES—To establish a Department of Public Works, to amend certain sections of the Social Security Act, and for other purposes. Introduced February 9, 1939, and referred to the Committee on Appropriations.
- H. J. Res. 83—TAYLOR—Appropriating \$725,000,000 for addition to the \$1,425,000,000 previously appropriated for Emergency Relief. Passed House January 13, 1939. Passed Senate amended January 27, 1939. Signed by the President February 4, 1939. Public Resolution No. 1.
- S. 913—TOBEY (H. J. Res. 124—MILLER; H. J. Res. 126—STEARNS)—To provide for the purchase and sale of timber in the New England hurricane-stricken area. Introduced January 23, 1939. Referred to the Committee on Appropriations.
- H. R. 2652—MARTIN, *Colorado*—To appropriate \$195,525,500 for the construction of flood control projects under the National Flood Control Act of 1936. Introduced January 16, 1939. Referred to the Committee on Appropriations.
- H. R. 2868—TAYLOR, *Colorado*—First Deficiency Appropriation Bill. Passed House January 23, 1939. Passed Senate amended February 6, 1939. In conference.
- H. R. 3743—WOODRUM—Independent Offices Appropriation Bill. Appropriating \$1,898,512,769 to operate independent government agencies for the year beginning July 1, 1939. Introduced and reported (Report No. 23) February 6, 1939. Passed House February 8, 1939.

EDUCATION

- H. R. 2532—BARRY—To provide for co-operation with the states in the promotion of conservation education in schools, colleges, and universities. Introduced January 13, 1939. Referred to the Committee on Education.

FORESTRY

- S. 1108—HOLMAN and SCHWELLENBACH (H. R. 3579—COFFEE, H. R. 3659—WALLGREN)—To restrict the exportation of Douglas fir peeler logs and Port Orford cedar logs. Introduced February 1, 1939. Referred to the Committee on Commerce.
- H. R. 3410—RANDOLPH—To amend section 9 of the Act of May 22, 1928, authorizing and directing a national survey of forest resources. Introduced January 30, 1939. Referred to the Committee on Agriculture.

GOVERNMENTAL FUNCTIONS

- S. 1110—THOMAS, *Utah*—To make the Civilian Conservation Corps permanent. Introduced February 1, 1939. Referred to the Committee on Education and Labor.
- S. 1182—REYNOLDS—To provide for military instruction and training for members of the Civilian Conservation Corps. Introduced February 2, 1939. Referred to the Committee on Military Affairs.
- H. Res. 60—COCHRAN—Authorizing continuation of the Select Committee on Governmental Organization during the 76th Congress. Introduced January 18, 1939. Agreed to on February 1, 1939.
- H. R. 3121—COFFEE—To create a National Natural Resources Corporation. Introduced January 24, 1939. Referred to the Committee on Ways and Means.

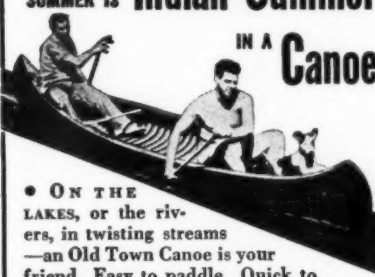
NATIONAL FORESTS

- S. 26—WHEELER (H. R. 3371—O'CONNOR)—To empower the President of the United States to create new national forest units and make additions to existing national forests in Montana. Reported without amendment (Report No. 38) by the Committee on Agriculture and Forestry, February 9, 1939.
- S. 1099—McCARRAN—To provide for the use of 10 per cent of the receipts from national forests for making range improvements. Introduced January 28, 1939. Referred to the Committee on Agriculture and Forestry.
- H. R. 2637—CALDWELL—To facilitate production of timber on lands within the National Forests of Florida. Introduced January 16, 1939. Referred to the Committee on Agriculture.

NATIONAL PARKS AND MONUMENTS

- S. 1188—ADAMS (H. R. 3648—DE-ROUEN)—To authorize the setting apart and preservation of wilderness areas in national parks and national monuments. Introduced February 6, 1939. Referred to the Committee on Public Lands and Surveys.
- H. R. 2961—DEROUEN—To provide for the establishment of the Green Mountain National Park in the State of Vermont. Introduced January 20, 1939. Referred to the Committee on the Public Lands.

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Fred C. Knapp, Portland, Or.
—BUYS AND SELLS—
Western Timber Lands

H. R. 3660—WALLGREN—To provide for the acquisition by the United States of lands not in federal ownership within the Olympic National Park. Introduced February 2, 1939. Referred to the Committee on the Public Lands.

H. R. 3794—GEARHART—To establish the John Muir-Kings Canyon National Park, California, to transfer thereto the lands now included in the General Grant National Park. Introduced February 7, 1939. Referred to the Committee on the Public Lands.

TREE DISEASES AND INSECTS

H. R. 3406—LEA (S. 519—MCNARY)—(S. 1262—JOHNSON)—To authorize regular appropriations for protection against the white pine blister rust. Introduced January 30, 1939. Referred to the Committee on Agriculture.

H. R. 2414—ENGELBRIGHT—To enable the Secretary of Agriculture to control emergency insect infestations on the national forests. Introduced January 12, 1939. Referred to the Committee on Agriculture.

WATER AND STREAM CONTROL

H. R. 3524—LEMKE—For a comprehensive system to impound, store, conserve, and make use of the unappropriated waters falling or emanating within the United States for irrigation and reclamation. Introduced January 31, 1939. Referred to the Committee on Irrigation and Reclamation.

H. R. 3792—GEARHART—Authorizing construction of Pine Flat Reservoir and other works in the Kings River Basin, California. Introduced February 7, 1939. Referred to the Committee on Irrigation and Reclamation.

WILD LIFE

H. Res. 65—ROBERTSON—Authorizing the continuation of the Special Committee on Wildlife Conservation during the 76th Congress. Agreed to on January 30, 1939.

H. R. 2960—DEROUEN—To authorize the Secretary of the Interior to sell or otherwise dispose of surplus animals inhabiting the national parks and national monuments. Introduced January 20, 1939. Referred to the Committee on the Public Lands.

MISCELLANEOUS

H. R. 3390—BOYKIN (H. R. 3641—BOYKIN)—An Act to regulate the importation of nursery stock and other plants and plant products; to enable the Secretary of Agriculture to establish and maintain quarantine districts for plant diseases and insect pests, etc. Introduced January 30, 1939. Referred to the Committee on Agriculture.

H. R. 2416—ENGELBRIGHT—To authorize the establishment and maintenance of an experimental range in California for conducting research in the management of range lands for sheep grazing. Introduced January 12, 1939. Referred to the Committee on Agriculture.

ASK THE FORESTER

Forestry Questions Submitted to The American Forestry Association, 919 - 17th St., N. W., Washington, D. C., Will Be Answered in This Column. . . . A Self-Addressed Stamped Envelope Should Accompany Your Letter.

QUESTION: How many species of oaks grow in southwestern Michigan and what are their names?—F. A. M., Kalamazoo, Michigan.

ANSWER: The following nine species of oak are native to southern Michigan: white oak, *Quercus alba*; swamp white oak, *Q. bicolor*; chinquapin oak, *Q. Muhlenbergii*; bur oak, *Q. macrocarpa*; northern red oak, *Q. borealis* var. *maxima*; black oak, *Q. velutina*; pin oak, *Q. palustris*; jack oak or northern pin oak, *Q. ellipsoidalis*; and scarlet oak, *Q. coccinea*.

In addition, one may find: blackjack oak, *Q. Marilandica* and shingle oak, *Q. imbricaria*.

QUESTION: Please settle a dispute between myself and one of my classmates. Is ebony wood always black? Or does it turn green with age—or envy—or something?—P. S. H., New York.

ANSWER: Ebony wood is not always black, but it is never green and does not turn green. The name Ebony is correctly applied to a number of woods belonging to the family *Ebenaceae*, and the genus *Diospyros*, of which our native persimmon is one of some 200 species. Most of the ebonyes are tropical and subtropical. The color of the heartwood of the several species varies from gray to brown, through orange-yellow to black, while some are brown with streaks or blotches of black. The most widely recognized black ebony is that of *Diospyros ebenum* from Ceylon. Another black ebony produced in India is *D. melanoxylon*, while the beautiful Macassar ebony comes from the Celebes Islands west of Borneo. The so-called green ebony of Jamaica, *Byrsonima ebenus*, like that of other dark colored tropical woods incorrectly marketed as ebony, belongs to an entirely different family. Trees of the genera *Maba*, *Euclea* and *Royena* also produce black or brownish timbers, which are distributed under the name of ebony.

QUESTION: What is the largest California pepper tree in America?—S. W. S., Washington, D. C.

ANSWER: The largest pepper tree (*Shinus molle*) recorded in the Hall of Fame for Trees is one in Carpinteria Valley, California. This was described and nominated by V. M. Nidever of Trail's End Ranch, Carpinteria. In 1931, when forty-seven years old, it was approximately sixty feet tall, had a crown spread of ninety-one feet, and the trunk at two and a half feet from the ground had a circumference of twenty feet.

Ralph Bryant Dies

Professor Ralph Clement Bryant, a member of the faculty of the Yale School of Forestry for over thirty-two years, and a former president of the Society of American Foresters, died of pneumonia February 1st at the New Haven Hospital, after an illness of ten days. He was Professor of Lumbering at Yale, and was described by Dean Henry S. Graves of the Yale School of Forestry as "a pioneer educator and leader in his special field of lumbering in its economic and technological aspects."

A native of Princeton, Illinois, and a grand-nephew of William Cullen Bryant, Professor Bryant was the first graduate of the College of Forestry at Cornell University in 1900. In 1907 the lumber manufacturers of the country joined in giving an endowment fund to the Yale School of Forestry for educational work in applied forestry and lumbering, and Professor Bryant was chosen to fill that chair. When he came to Yale he had

already a background of experience in the Bureau of Forestry in the Philippines, of which he was Assistant Chief.

He served as president of the Society of American Foresters for two terms, had been a member of its Executive Council, and chairman of various committees concerned with wood utilization problems. He was the author of two textbooks,—"Logging" and "Lumbering."

"His constructive work during his long service at Yale is widely recognized both in educational circles and throughout the country," Dean Graves said. "His books and other publications have had wide influence in forest schools and among practicing foresters and lumbermen."

"Professor Bryant was a man of cultivation, wide interests and personal charm. He had keen perception and sound judgment, which added to his influence in guiding the affairs of the School of Forestry and of other organizations with which he was affiliated."

Markets for Wind-Felled Forests

(Continued from page 118)


to return economic values, new products and new methods of use must be developed. Second, utilization will be confronted in the future, even more than in the past, with intense competition from other woods. As forest management advances in New England, so will it most certainly advance in other regions. It must be realized that national success with forestry practice will provide annual timber crops which will require a national consumption from two to three times greater than at present. Third, as in the past, there will be competition from a host of other products from other raw materials, developed by science and by applied technology in the hands of the competitors of wood. This has been a most significant factor in the decline by one-half in the national per capita consumption of lumber between the years 1908 and 1928. Even wood pulp production, which has increased by leaps and bounds throughout the last thirty years, is today threatened by competitive products which may seriously affect its future. While the last decade has seen cotton, wool, and silk being replaced by cellulose products from wood pulp, such as rayon and cellophane, today we find research developing artificial wool from soy beans and from casein, the curd of milk; we find fabrics from glass already being used commercially in the chemical industries and being offered also for hangings and draperies. And within the last few weeks, Professor Hauser of the Massachusetts Institute of Technology has discovered a new transparent film product from bentonite clay that is reported to be strong, water and fire proof, and of high electrical resistance. It is already attracting technical attention as a possible material for some present pulp uses.

However, with persistent and adequate research for the improvement of products and development of new uses,

there is every reason to face the future with confidence. Henry Ford has recently characterized New England as having the greatest agricultural and industrial possibilities in the country. It has a relatively high density of population, with earning and consuming power second to none; a predepression annual wood consumption equalling the annual crop which its forests can ultimately supply; it is contiguous to the great consuming regions of New York, New Jersey, and Pennsylvania, whose requirements, added to its own, account for one-fourth of the national lumber cut but are supplied to the extent of more than two-thirds by material shipped in; and it is close to harbors and sea ports for export shipment.

With such a natural setting it would seem no impossible or Herculean task for New England to capture and retain the economic and social values that are available from its forest lands. But it will require the rehabilitation of these lands. And, at the same time, it must not be forgotten that while the magnitude of forest industries is limited by the extent and character of the forest supply, it is controlled by the quantity of products that can be profitably sold. Further, the economic importance of an industry is not gaged by the quantity of raw material it may use but by the wages it can pay and the capital it can usefully employ. Obviously, converting a cord of wood from pulp to rayon to underwear, and distributing it in that way to the public, will provide more wages and employ more capital than using it for domestic firewood. That is why new products and uses are so important to New England's future forest prosperity. (This article is based on a paper presented by the author to the Agricultural Committee of the New England Council.)

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See D. B. SMITH Ad on Page 125

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outstanding Tool for Forester,
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tendent, and Utility Engineer.

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Rain on the River

(Continued from page 105)

cayuco, torn from its moorings, shot by in wild gyrations, leaping from wave to wave, dodging with eerie precision when floating logs or debris threatened destruction. Far across the flood a large section of the bank suddenly melted like sugar and vanished—a thrifty Indian's neatly tilled acres were a shallow whirlpool.

We did not, however, fully appreciate the ravages of these floods until we started, weeks later, on the northward journey toward the sea. From the ranch landing to the junction of the Tulijá River we worked through, sneaked around or were portaged over on our *indios'* shoulders, no less than seventeen rapids in exactly one hour and thirty-six minutes. The same trip, coming south against the flood, required twelve and a quarter hours, and there were fewer rapids. Many of the new rapids and shoals were formed by tremendous trees, some nearly a hundred feet long, which had wedged in shallow water, created terrific eddies, and piled up formidable ledges of mud, rock and sand behind and alongside. One tree blocked the entire stream so effectively the men had to carry us on their shoulders fifty yards, empty the canoe of all weight and carry that to safety, and finally half-lift, half-drag the heavy craft into deep water.

We started north the day before Christmas, and late that afternoon made camp on a narrow strip of beautiful pebbly beach on the little Basean River. Dinner was a huge success, and after the *comiteico*, native brandy, was disposed of

we lay back in our cots and sang Christmas carols, yarning about other Christmas Eves all over the world, and finally lay listening to the steady hammer of the never-ceasing rain. The tent was not more than a foot above water level.

About half-past nine we were awakened by a bellow of "Ronda! Ronda!" A *ronda* is a mass migration of ants—billions and trillions of ants. Still more ants! When driven from their hills by floods, or for whatever reason that seems good to ant minds, the fierce little insects pour out in countless hordes. Whatever happens to be in their way is destroyed as completely as sharp teeth can do it. Our *indios* were leaping about wildly, slapping and clawing at themselves, shrieking as the ants chewed into them, throwing themselves into the water and rolling on the pebbles in agony. But it wasn't exactly a "ronda." As he was turning in for the night, one of the men had thrust his long sweep right through the middle of a big ant hill no one had noticed. Instantly several thousand red ants were resentful.

Just as we were about to fall asleep again, Don Max observed cheerily: "*Dios mio!* I hope this rain is only here. If it is bad in the hills, the Basean will come down in a bore. It is too far to swim to Salto!"

A very narrow stream, often between high banks, the Basean at flood times not infrequently descends without warning in a solid crest, sweeping everything before it, drowning humans and animals, smashing canoes and washing out plantations.

Financial Statement

The American Forestry Association

BALANCE SHEET AS OF DECEMBER 31, 1938

ASSETS		LIABILITIES AND CAPITAL	
Cash	\$4,679.33	Accounts Payable	\$2,455.00
General Fund Investment	9,100.00	Loans from Reserve Fund	4,200.00
Accounts Receivable	2,558.49	Reserves:	
Accrued Interest Receivable	3,041.57	Prepaid Member-	
Inventories	2,849.54	ships	\$27,281.61
Deferred Charges	5,549.25	Dutch Elm Tree Dis-	
Special Revolving Fund	10,000.00	ease Project	229.84
Endowment Fund (Including Real Estate)	280,553.76	Trail Riders	309.25
Furniture and Fixtures	3,792.42	Forest Fire Medal Project	1,254.96
TOTAL	\$322,124.36		\$29,075.66
		Surplus	286,393.70
		TOTAL	\$322,124.36

INCOME AND EXPENSE ACCOUNT FOR YEAR ENDED DECEMBER 31, 1938

EXPENSES		INCOME	
General Administration	\$24,648.43	Membership Dues	\$56,950.51
American Forests Magazine	32,333.43	Advertising	13,581.76
Conservation Magazine	1,554.86	Interest	6,270.58
Membership	18,059.44	Donations	6,880.61
Forester's Office	10,124.34	Forester's Office	4,217.60
Educational Publicity	5,879.59	Miscellaneous	2,944.12
Special Forest Fire Projects	926.68	Sale of Publications	1,421.29
Operating Surplus	478.86	Conservation Magazine	1,739.16
TOTAL	\$94,005.63	TOTAL	\$94,005.63

There was nothing we could do about it, however, so went hopefully to sleep.

Just as the Christmas bells were pealing midnight in the far away snowy north, Ciriaco, the steward, roused us hastily—and we literally had fish in our pants! There in our cots, as we sat erect and so pressed them down into the icy water, swam a whole school of vivid little fish clearly discernible in the lamplight. Bigger fish swam nervously about through the tent, for the river had come up a good three feet, though fortunately, not in a bore.

A few minutes later the men had carried us, pickaback, to our places in the canoe, hauled a smothering tarpaulin over us to keep out the mosquitoes, taken our tent to a higher spot far up the bank, where they managed to get a fire going, and resumed their cooking and gorging. As we three lay in steaming discomfort, a *javalí* came close to the water and squealed angrily. Across the river a *tigre* roared till the jungle quivered.

Christmas day brought more rain, then dazzling sunshine, and a glimpse of a howling monkey family of three, the baby nursing contentedly while its parents howled raucously at us. Two tremendous scarlet-blue-yellow macaws came sailing down the gale and alighted in a tree close by, scolding wickedly when our huntsman, Ciriaco, missed them with both barrels. A big flight of the little green Palanqueño parrots, talkers all, chattered overhead crying out their Spanish name—"Loro! Loro! Loro!", meaning parrot—as passports to safety. The father of all alligators gave us a fleeting glimpse of his menacing head, which must have been easily three feet long. On an overhanging branch perched a yellow-and-black toucan, ridiculously overweighted by his tremendous beak. In the distance, sweet, faint and slightly shrill, we heard the plaintive fluting of the *tezontle*, the Aztec nightingale.

The floods were falling back, the jungle coming to life and expression again.

Wood As a Paving Material

(Continued from page 126)

of this kind, the proportion of materials used is about forty-one per cent of wood, fifty-five per cent gravel and stone chips, and three per cent emulsion. Thirty unskilled workmen can lay from 350 to 600 yards of road a day.

The above applies to tracks that are to be laid on virgin soil for light duty, but if the road is intended to serve for heavier traffic, the substructure should be firmer. In the case where macadam is already laid down, its surface will be repaired and cambered as required, and the wooden cylinders laid on this by hand as in the case of light tracks. In the event there is no ready made bed, this may be made by ramming wooden cylinders of from eight to ten inches in length into the subsoil. The gaps are filled with chips or gravel, the whole sprayed with water and well rolled in to the desired camber until the whole is firm and unyielding. The

HOST to the WORLD



On to The Mayflower in March!

The Mayflower Hotel looks forward with much pleasure to The American Forestry Association's Dinner Meeting, to be held in the Grand Ballroom on the evening of March 22, 1939, and expresses its sincere desire to help make this meeting during the Association's 64th year, an overwhelming success.

This modern, 1,000 ROOM HOTEL, also extends a cordial invitation to the American Forestry Association and its members to "Make The Mayflower Your Home In March."

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SINGLE ROOMS FROM \$4
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THE Mayflower

WASHINGTON, D. C.

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March, 1939**

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actual road surface is laid on the top of this substructure.

Roads intended for really heavy duty are made in the same way, but with a correspondingly stronger substructure. This may either be of macadam, stone, or wood. In any case, the wood must be laid on chips, sand or gravel being unsuitable for heavy duty.

For streets in the city, where there is but little really heavy traffic, and automobiles represent the bulk of the vehicles, the surface may consist of thin oak or other hardwood cylinders laid on concrete or other firm substructure. The gaps are filled with emulsion and the surface dressed with chips.

In all types of wooden road surfaces, the wood must be green, that is, still containing sap, and not cut, debarked, or impregnated until immediately prior to laying. This humidity, and the constant spraying with water during rolling is intended to ensure that a minimum condition of swelling is present at the laying so that subsequent wet weather cannot cause unforeseen expansion, which would lead to dangerous bulging of the surface.

The advantages of the Deidesheimer method of paving are manifold. The blocks are laid with the grain vertical, thus offering great resistance to compression, a resistance that is increased by the stone chips being rolled in so that the latter penetrate into the wood and form a firm unit. It is moreover well known that round wood in its natural shape is less likely to contract or swell than the split rectangular blocks. Then there is the fact that the round blocks touch each other only at certain points, the interstices representing thirty per cent of the total surface and being filled with an elastic stone mass, afford an opportunity for slight adjustments of size caused by pressure or climatic conditions. As a matter of fact, the only effect of any expansion of the blocks is to force the stone chips still more firmly into them, thus but adding to the homogeneity and firmness of the surface. The Deidesheimer road is moreover practically skid-proof, owing to the fine chips that are firmly rolled into the tops of the cylinders. It is obvious that the end grain, into which chips have been forced, is much less slippery than asphalt or stone on which there is always a layer of fine dust.

Actual experience has been made with these roads in various European countries. In Germany, there is a five-mile stretch at Birkenwerder, near Berlin, another of six miles at the Stettiner Haff, and various other smaller trial stretches throughout the country. In Switzerland, there is an interesting mountain road with the Deidesheimer surface near Chur; in Austria several long stretches, notably at Villach and Dolina-Kreuzerhof; and Czechoslovakia and Poland have been so impressed with the favorable results in other countries that it has been decided to lay down a number of roads with the new surface.

WHO'S WHO

Among the Authors in This Issue

ARTHUR STANLEY RIGGS (*Rain on the River*) is a writer by profession and began what he calls his "career of crime" with a country newspaper, going on to New York dailies. A magazine contributor for many years, Mr. Riggs is also the author of several books.

HERMAN WORK (*Taking Forestry to the Woods*) learned early to like and respect skilled use of tools in wood and field. Until the War, he was with the Forest Service in the West, and then joined the 10th and 20th Engineers. Since then he has been buying wood for the West Virginia Pulp and Paper Company.



Herman Work

WILLIAM T. COX (*Marsh Firebreaks*), who is now wildlife conservationist for the Soil Conservation Service in the Lake States Region, has a distinguished and interesting record of service at home and abroad. After brilliant work in the West from 1906 until 1929, Mr. Cox was asked by the Government of Brazil to organize a federal Forest Service for Brazil. He accepted and spent three years in South America.

E. F. RAPRAEGER (*Matches from Idaho's White Pine*) specializes in timber utilization in Montana and Idaho. He entered the Forest Service in 1930 and is now on the staff of the Northern Rocky Mountain Forest and Range Experiment Station at Missoula, Montana.

CARLILE P. WINSLOW (*Markets for New England's Wind-Felled Forests*) is America's foremost authority on wood utilization problems. He entered the Forest Service in 1908 and nine years later succeeded to the directorship of the Forest Products Laboratory. Under his direction the Laboratory gained much of the prestige which it at present holds in the field of wood research and utilization.

R. KENT BEATTIE and BOWEN S. CRANDALL (*Disease Attacks the Persimmon*). Mr. Beattie, plant pathologist in the Bureau of Plant Industry, has traveled extensively throughout Asia, as well as Europe, in the study of tree diseases. Mr. Crandall, a colleague of Mr. Beattie, spends most of his time in the field, devoting himself primarily to the study of the persimmon wilt.

G. H. COLLINGWOOD (*Persimmon and Forestry in Congress*) is forester for The American Forestry Association.

A. ROBERT THOMPSON (*Your Shade Trees*) is in charge of shade tree work with the branch of forestry of the National Park Service.

COVER—"Windswept" Pine on Georgian Bay, Ontario, Canada. Photograph by John Kabel.

LET YOUR NEXT VACATION BE A JOURNEY TO THE WILDERNESS



The American Forestry Association again invites you and your friends to join one or more expeditions of its Trail Riders of the Wilderness this summer. Five trips are planned.

No. 1—Flathead-Sun River Wilderness, Montana
July 3 to July 15.

No. 2—Sawtooth Wilderness, Idaho
July 18 to July 31.

No. 3—Gila Wilderness, New Mexico
August 1 to August 13.

No. 4—Maroon Bells-Snowmass Wilderness, Colorado
August 3 to August 16.

No. 5—Kings River Wilderness, California
August 20 to September 1.

All expeditions are carefully organized with experienced guides, packers, wranglers and cooks. A physician is with each party; so are representatives of The American Forestry Association and the United States Forest Service. Nearly 400 men and women have ridden with these expeditions since 1933. Make this *your* year to ride—an experience you will never forget. Write for reservations and detailed information concerning the expeditions.

THE AMERICAN FORESTRY ASSOCIATION

919 Seventeenth Street, N. W.

Washington, D. C.



THREE TREES

that grow well with
Rhododendron



BIRCH

Common "white"
Birch (*populifolia*).
Plant 3 in one hole
to make a clump.
1½ foot, \$8 per 100
6 foot, \$12.50 for 10
Also offer Paper
Birch, slightly more.



DOGWOOD

White Flowering.
(*Cornus florida*).
Gorgeous show in
spring. Takes acid
soil, same as Rhodo-
dendrons. (So do
other trees listed.)

(100)
1 foot \$8.00
1½ foot 11.00
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Pink (grafted)

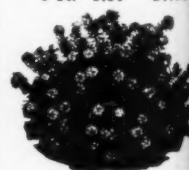
(5) (25)
1 ft. \$3.75 \$17.50
2 ft. 7.75 37.50
3 ft. 12.50 50.00



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White, fragrant,
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leaves blaze in au-
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10 in. \$1.25 \$10.00
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dwarf, sun and lime.
Fragrant pink cover
plant in May, occa-
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summer and again
in September. Keeps
low and spreads to
about 18 in. wide.
Wonderful perma-
nent border.

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9 in. \$1.25 11.00
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Rhododendron

Maximum. One stem.
catawbiense. One and two stems.
carolina. Bushier. Some flowers.

Kalmia. One and two stems.

Azaleas. All one and two stems.

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	(10)	(25)	(100)
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Calendulacea	\$5.00	\$8.00	\$30.00
arborescens	5.00	10.00	35.00
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Leucothoe			
catesbaei	\$4.50	\$7.50	\$27.50
Kalmia (laurel)			
latifolia	4.00	7.00	25.00
Rhododendron			
carolina	5.00	8.00	30.00
catawbiense	5.00	8.00	30.00
maximum	3.75	7.00	20.00

These are collected carefully with a small ball of earth and are easily planted and grown. In four years they will be full bushy specimens in bloom and worth about eight times the price you pay now.

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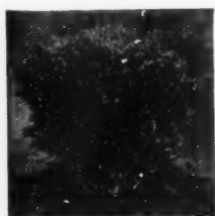
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Planted 1½ feet apart,
the Japanese Yew makes
the finest evergreen
hedge in the world and
is hardy everywhere. We
offer:

	(100)
10 to 15 in. xx.....	\$55.00
15 to 18 in. xxx.....	90.00
2 feet (balled).....	250.00

(also smaller sizes)

8 to 10 in. x	25.00
4 to 6 in. x	17.50



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